

CHAPTER 4

RIGGING M198, 155-MM HOWITZER ON TYPE V PLATFORM

Section I

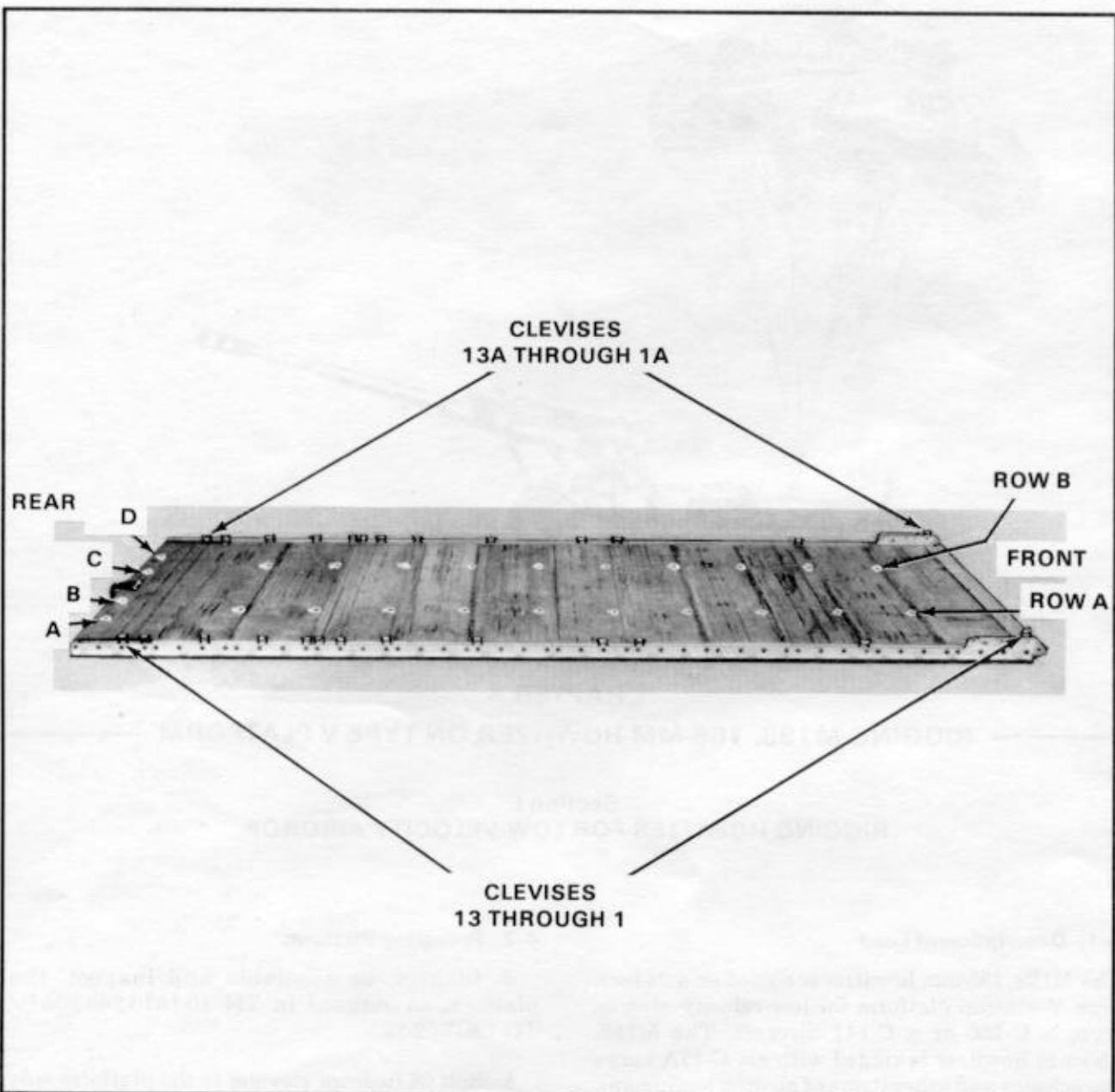
RIGGING HOWITZER FOR LOW-VELOCITY AIRDROP

4-1. Description of Load

The M198, 155-mm howitzer is rigged on a 24-foot, type V airdrop platform for low-velocity airdrop from a C-130 or a C-141 aircraft. The M198, 155-mm howitzer is rigged with six G-11A cargo parachutes and other items of airdrop equipment. The accompanying equipment (section chest, camouflage net and poles, cleaning pail, and pioneer tools) may be rigged with the howitzer. The accompanying equipment rigged as a part of the load weighs 610 pounds.

4-2. Preparing Platform

- a. Inspect, or assemble and inspect, the platform as outlined in TM 10-1670-268-20&P/TO 13C7-52-22.
- b. Bolt 26 tiedown clevises to the platform side rail bushings and number the clevises as shown in figure 4-1.



Step:

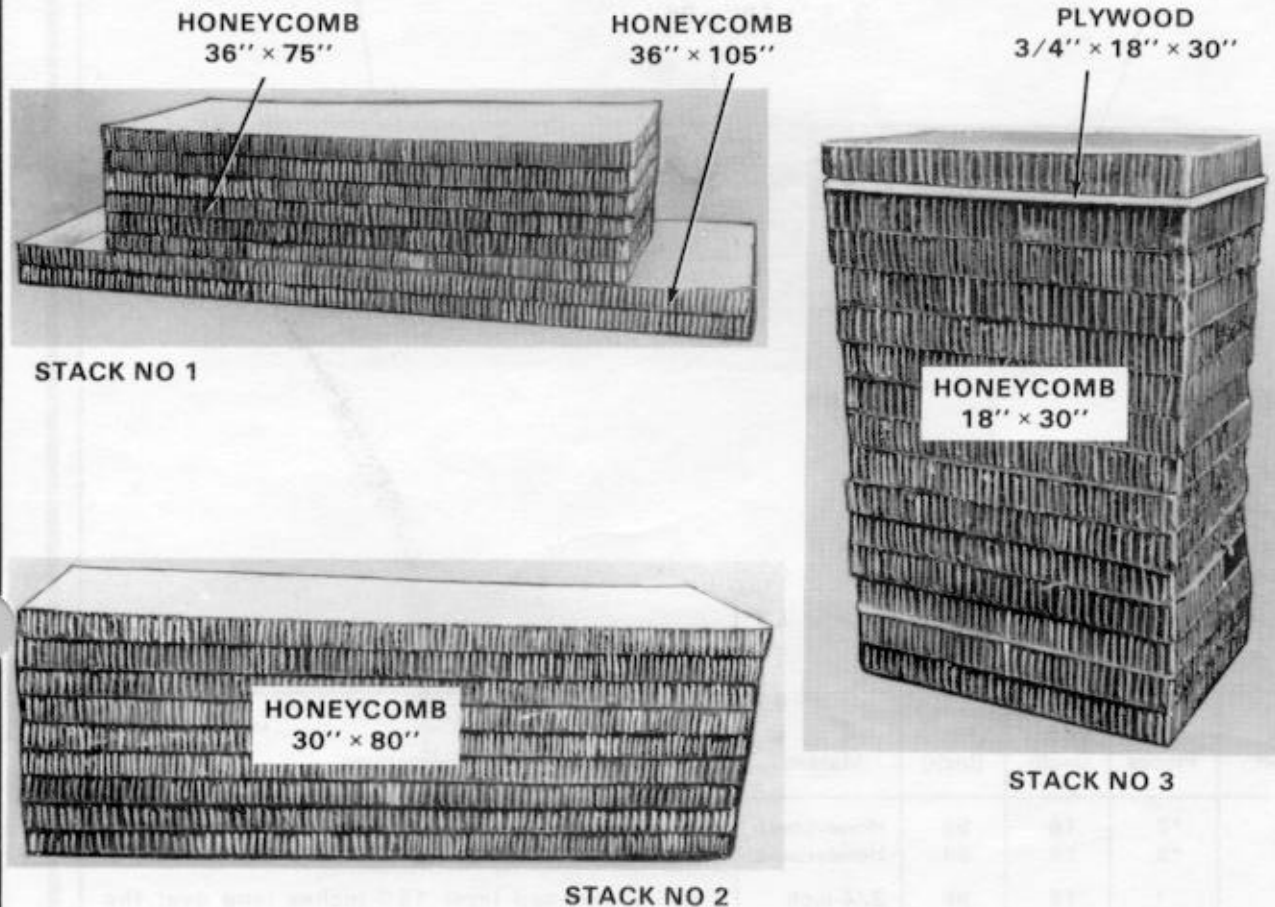
1. Install a multipurpose link on the front of each rail.
2. Bolt 13 load tiedown clevises to each platform side rail according to FM 10-500/TO 13C7-1-5. Starting at the front of each rail, bolt a tiedown clevis to the first bushing of the multipurpose link and to bushings 9, 20, 22, 28, 33, 35, 36, 37, 39, 42, 45, and 46.
3. Starting at the front of each rail, number the clevises bolted to the right rail from 1 through 13 and those bolted to the left rail from 1A through 13A.
4. Letter the rear row of four deck rings according to FM 10-500/TO 13C7-1-5.

Figure 4-1. Platform prepared.

4-3. Building and Placing Honeycomb Stacks

Build five honeycomb stacks and place them on the platform as shown in figures 4-2 through 4-6.

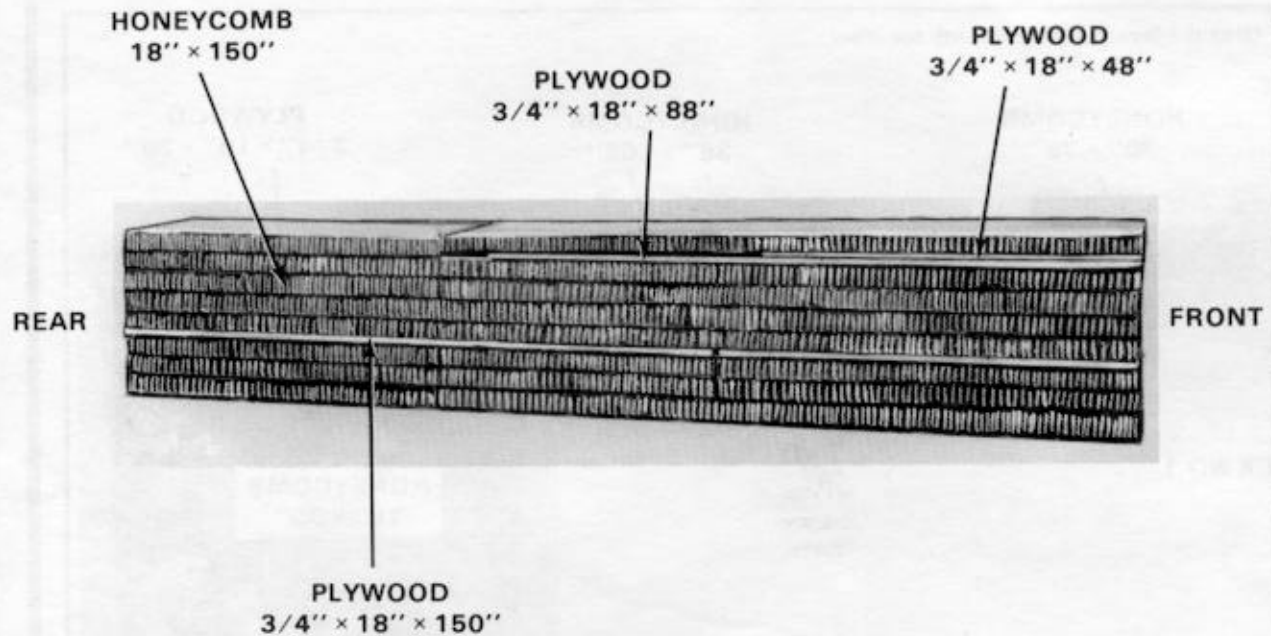
Note: Glue the layers of honeycomb together.



Stack Number	Pieces	Width (inch)	Length (inch)	Material	Instructions
1	*2	36	9	Honeycomb	Use honeycomb to make a two-layer base 105 inches long.
	*2	36	96	Honeycomb	
	6	36	75	Honeycomb	Stack and center the 75-inch pieces on the base.
2	9	30	80	Honeycomb	Form a stack.
3	15	18	30	Honeycomb	Form a stack with the plywood under the top layer.
	1	18	30	3/4-inch plywood	

*Alternate the sizes of honeycomb in each layer.

Figure 4-2. Honeycomb stacks 1, 2, and 3 prepared.

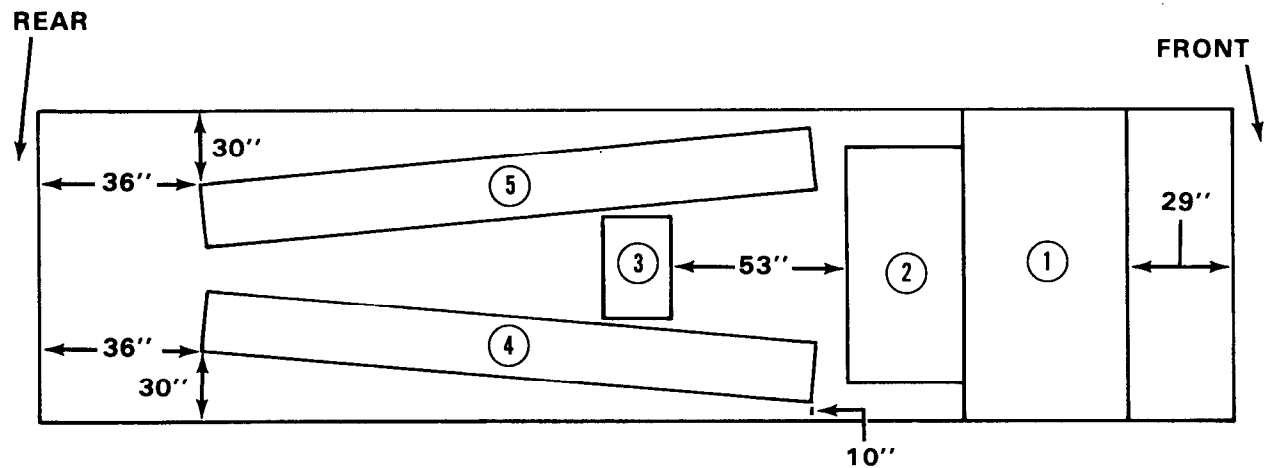


Stack Number	Pieces	Width (inch)	Length (inch)	Material	Instructions
4	*3	18	96	Honeycomb	Use honeycomb to make a three-layer base 150 inches long.
	*3	18	54	Honeycomb	
	1	18	96	3/4-inch plywood	Form a plywood layer 150 inches long over the honeycomb base.
	1	18	54	3/4-inch plywood	
	*4	18	96	Honeycomb	Use honeycomb to make four layers 150 inches long.
	*4	18	54	Honeycomb	
	1	18	88	3/4-inch plywood	Place plywood on top of the four layers of the honeycomb on the front edge of the stack.
	1	18	48	3/4-inch plywood	Place plywood on top of the 88-inch piece flush with the front of the stack.
	1	18	96	Honeycomb	Use honeycomb to make a layer 150 inches long, and place it on top of the stack.
	1	18	54	Honeycomb	
5	Same as stack 4.				

*Alternate the sizes of honeycomb in each layer.

Figure 4-3. Honeycomb stacks 4 and 5 prepared.

Note: Not drawn to scale



Stack Number	Position of Stack on Platform
<p>①</p> <p>②</p> <p>③</p> <p>④</p> <p>⑤</p>	<p>Place stack:</p> <p>29 inches from the front edge of the platform and centered between the side rails.</p> <p>flush against stack No 1 and centered between the side rails.</p> <p>53 inches from stack No 2 and centered between the side rails.</p> <p>36 inches from the rear edge of the platform. Place the front outside corner 10 inches from the right rail. Place the rear outside corner 30 inches from the right rail.</p> <p>36 inches from the rear edge of the platform. Place the front outside corner 10 inches from the left rail. Place the rear outside corner 30 inches from the left rail.</p>

Figure 4-4. Honeycomb placed on platform.

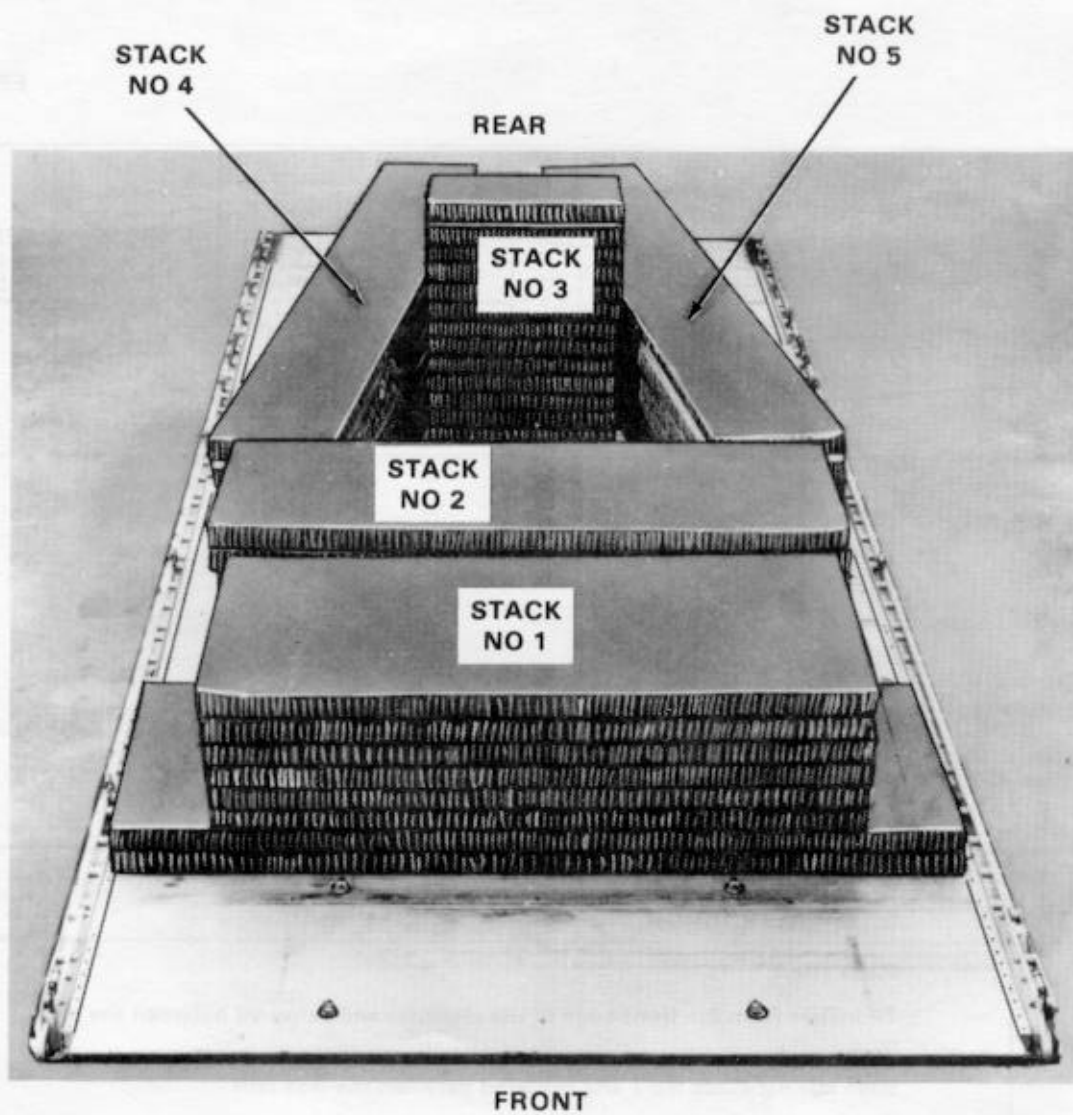


Figure 4-5. Front view of honeycomb stacks.

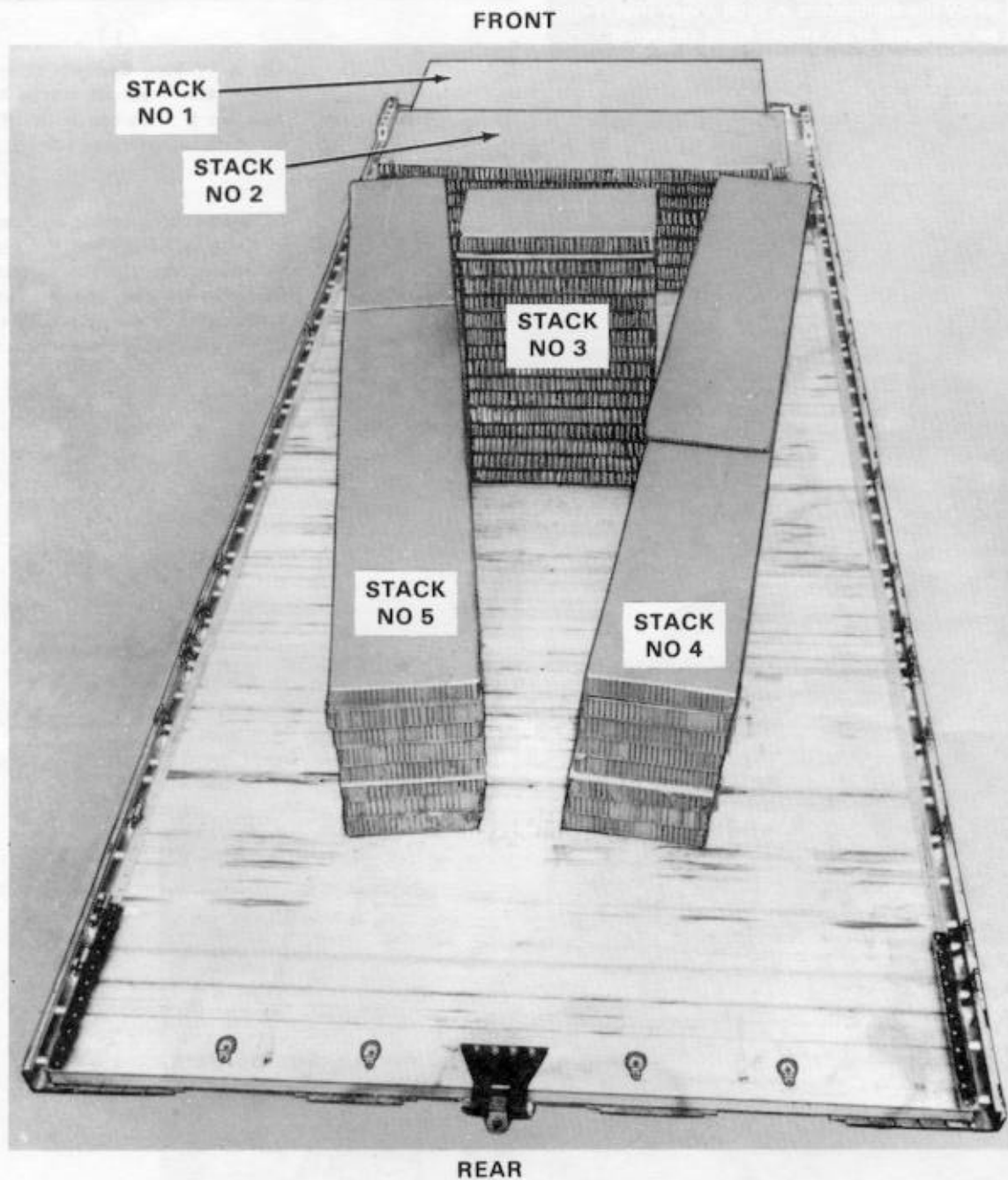


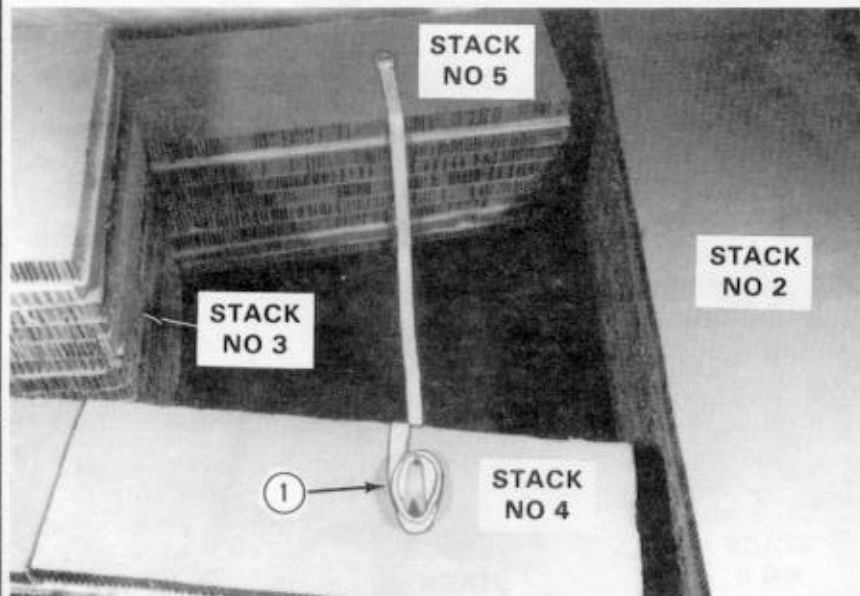
Figure 4-6. Rear view of honeycomb stacks.

4-4. Stowing Accompanying Equipment

If the accompanying equipment (para 4-1) is to be dropped, stow it as shown in figure 4-7.

CAUTION

Stow the equipment in such a way that it will be no higher than stacks No 4 and No 5.



①

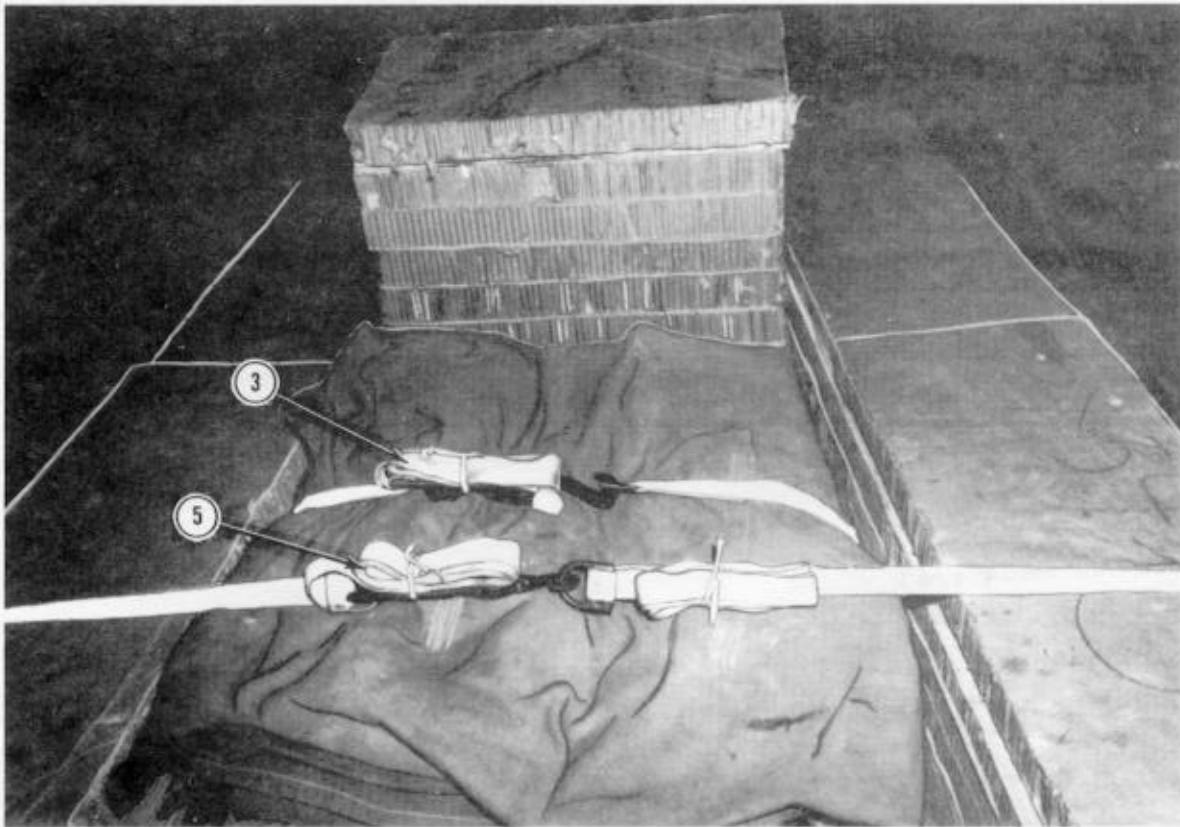
Lay a 15-foot tiedown strap on the platform across stacks No 4 and No 5 with the ends of the strap on top of these stacks.

②

Fit the accompanying equipment in the space between the stacks on top of the strap. If lumber is included in the accompanying equipment, stow it on its edge against stacks No 4 and No 5 as shown.



Figure 4-7. Accompanying equipment stowed.



- ③ Bind the equipment with the 15-ft tiedown strap, a D-ring, and a load binder.
- ④ Pass the free end of a 15-foot tiedown strap through clevis 4A and a second strap through clevis 4. Run each strap through its own D-ring, and pull the straps taut (not shown).
- ⑤ Run these straps up over stacks No 4 and No 5, and hook the straps together with two D-rings and a load binder.

Figure 4-7. Continued.

4-5. Preparing Howitzer

a. Insure that the metal breechblock support bracket is available. A howitzer that has been previously airdropped should have its own breechblock support bracket. If a bracket is not available for the howitzer to be rigged, use the specifications given in figure 4-8 to construct one. The breechblock support is constructed of steel.

Note: Not drawn to scale

CAUTION

The breechblock support bracket must be fitted to the individual howitzer.

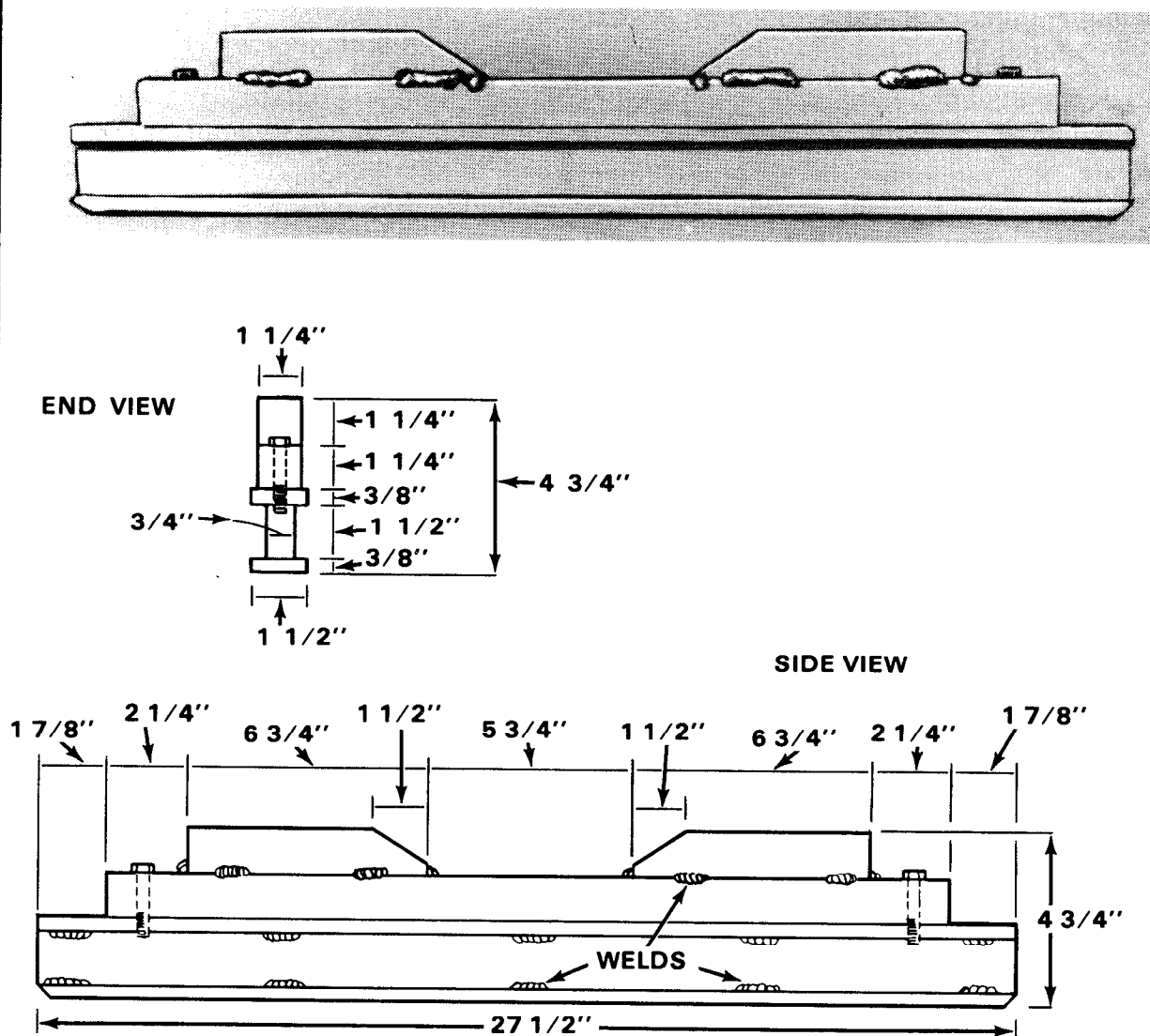


Figure 4-8. Breechblock support bracket constructed.

Note: The support is made to allow for metal shims to be inserted to insure a snug fit under the breechblock.

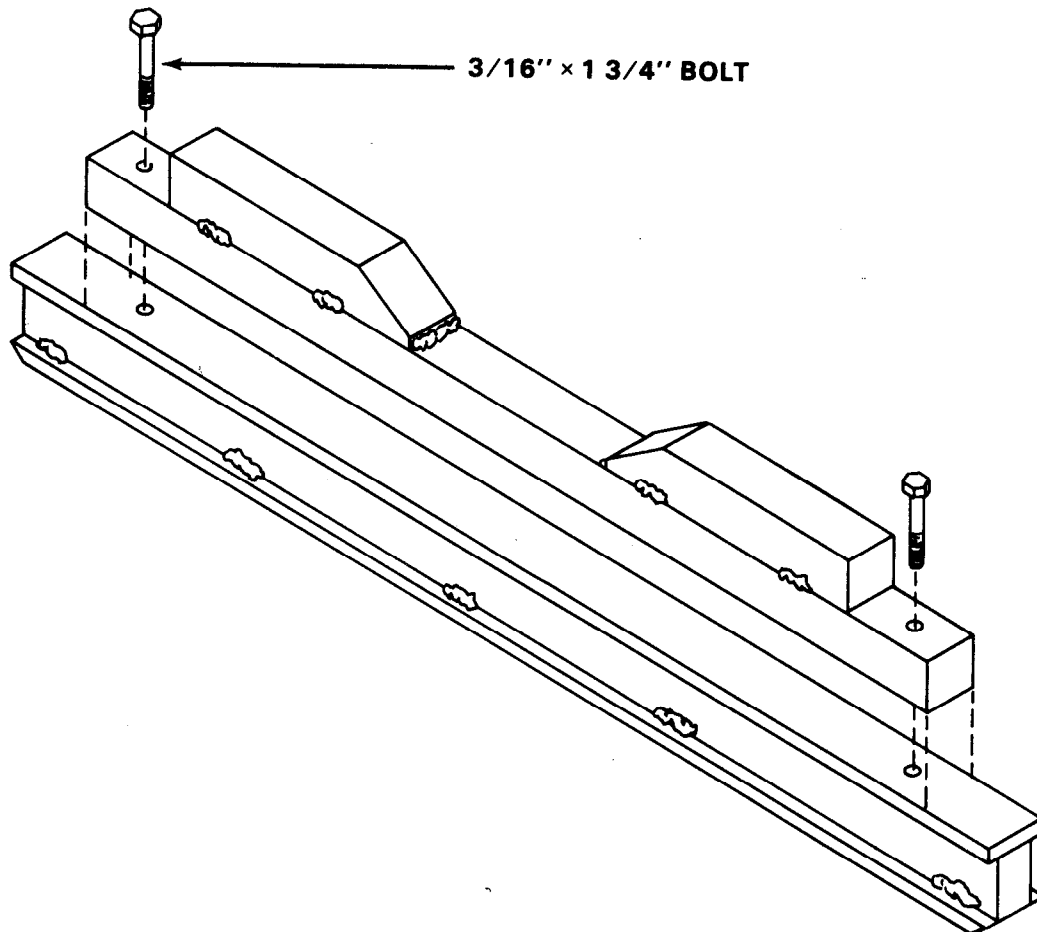
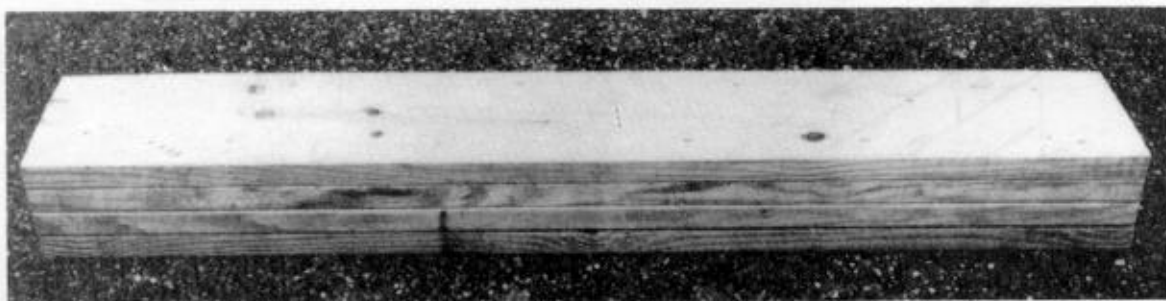


Figure 4-8. Continued.

b. Use 2- by 6-inch and 2- by 10-inch lumber to build the wooden support blocks (for the gun tube) according to details in figures 4-9 and 4-10.

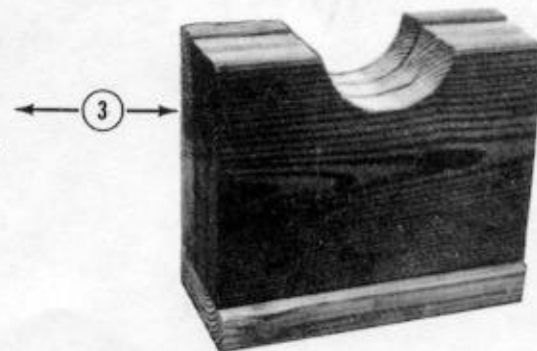
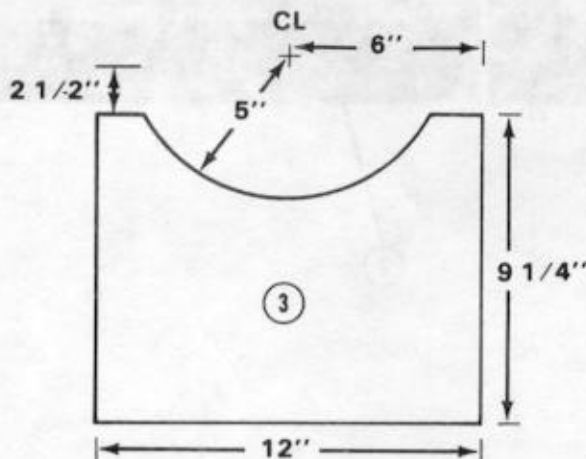
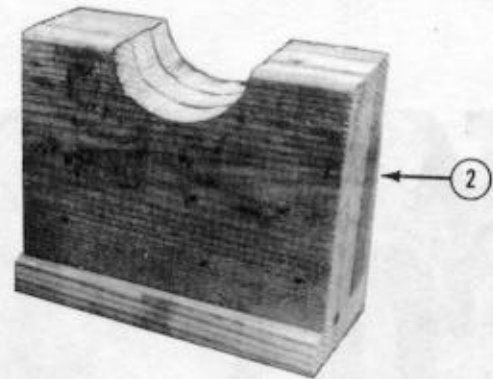
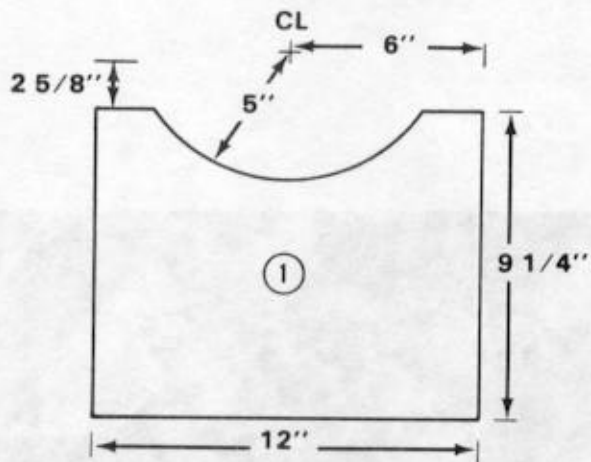
Note: The actual width of 2- by 10-inch lumber is 9 1/4 inches.



- ① Cut four 2- by 10- by 57-inch pieces of lumber.
- ② Nail the four pieces of lumber together with 20d nails.

Figure 4-9. Rear gun tube support block constructed.

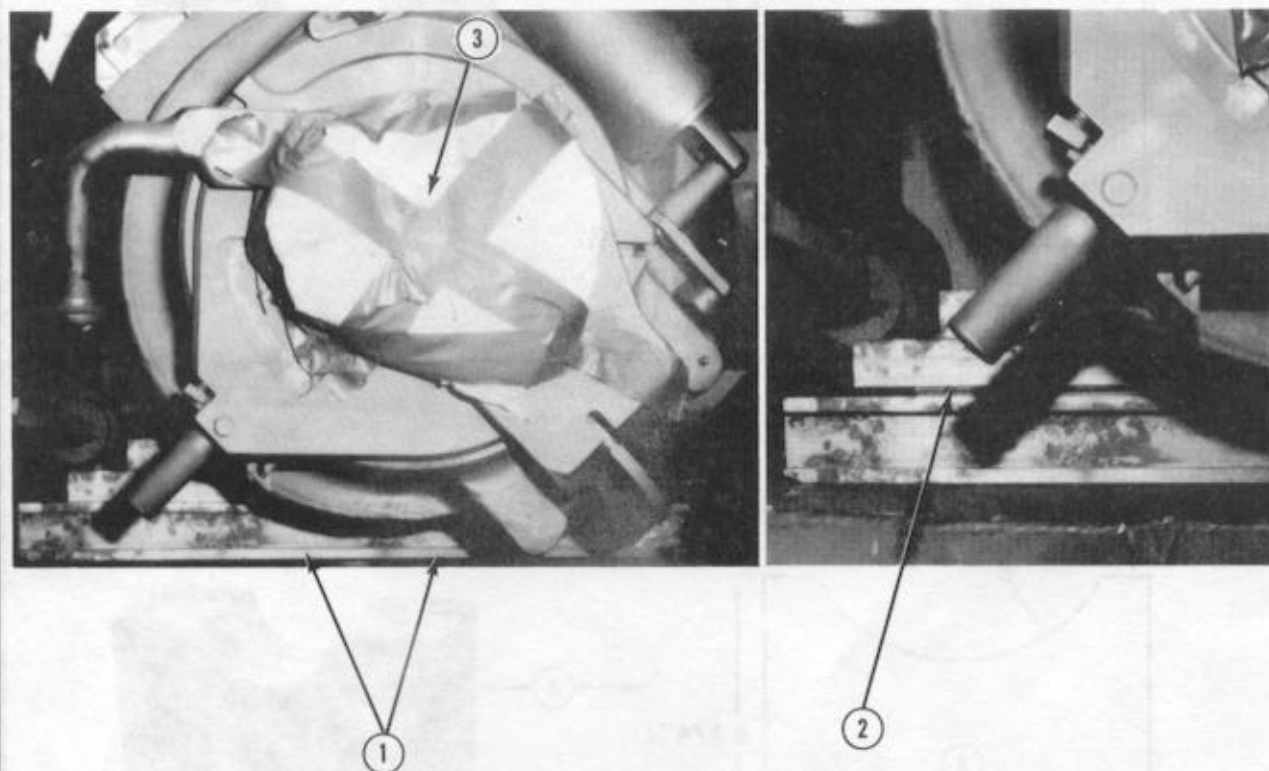
- Notes: a. These drawings are not drawn to scale.
 b. The actual width of 2- by 6-inch lumber is 5 1/2 inches.
 c. The actual width of 2- by 10-inch lumber is 9 1/4 inches.



- ① Make an arc-like cutout in three 2- by 10- by 12-inch pieces of lumber.
- ② Nail the pieces together and to a 2- by 6- by 12-inch piece of lumber with 20d nails.
- ③ Make an arc-like cutout in three 2- by 10- by 12-inch pieces of lumber. Nail the pieces as in 2 above.

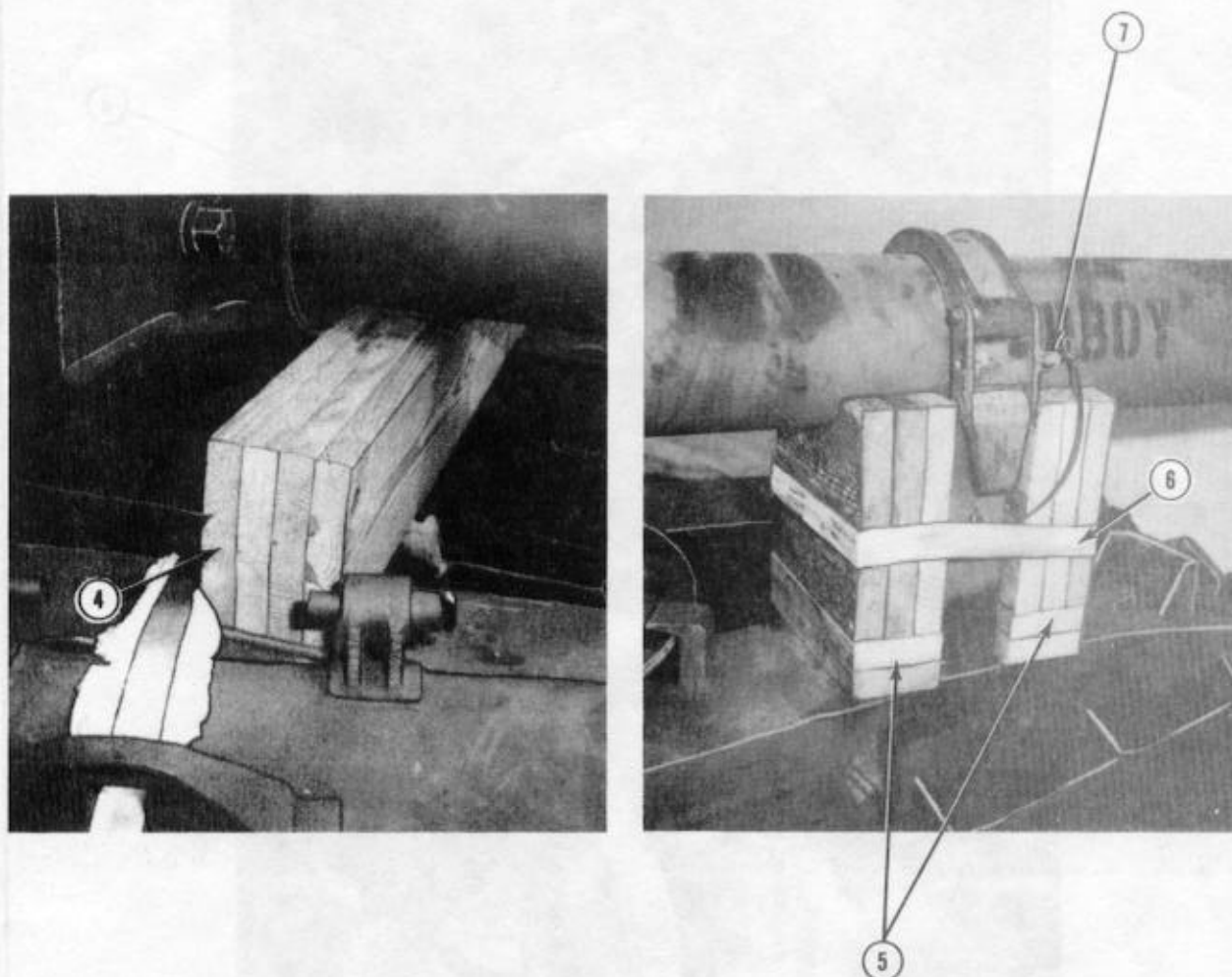
Figure 4-10. Forward gun tube support blocks constructed.

c. Prepare the howitzer as shown in figures 4-11 through 4-16. Place the gun tube in the stowed position before preparing the howitzer.



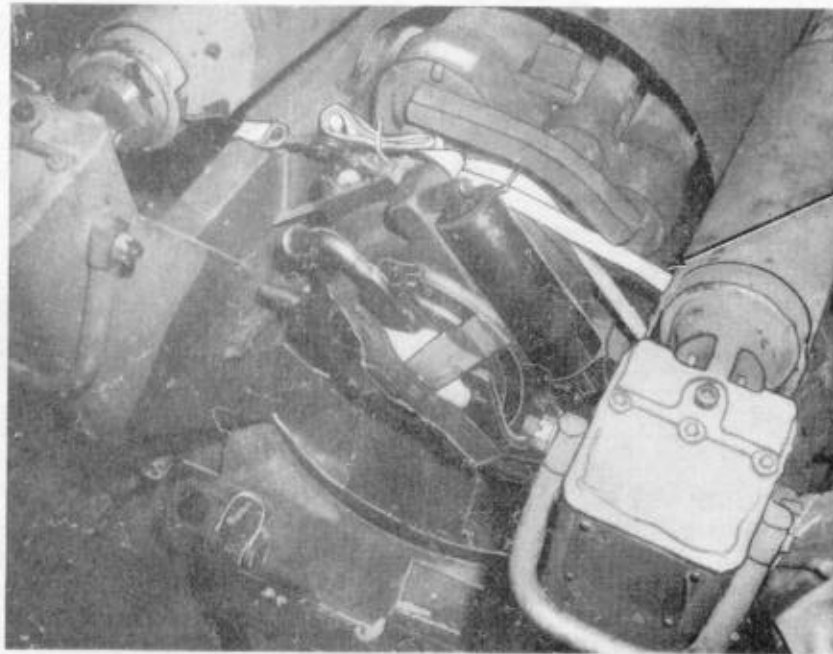
- ① Move the gun tube of the howitzer to the stowed position. Raise the tube, and place the metal support bracket (fig 4-8) under the breechblock.
- ② Be sure that the fit is snug. The bracket should not move when the breechblock rests on it. If necessary, remove and disassemble the bracket and place metal shims in the space provided. Reassemble and replace the bracket. A bracket with shims installed is shown in the photograph on the right above.
- ③ Pad the end of the breechblock with cellulose wadding. Tape the wadding in place.

Figure 4-11. Gun tube prepared.



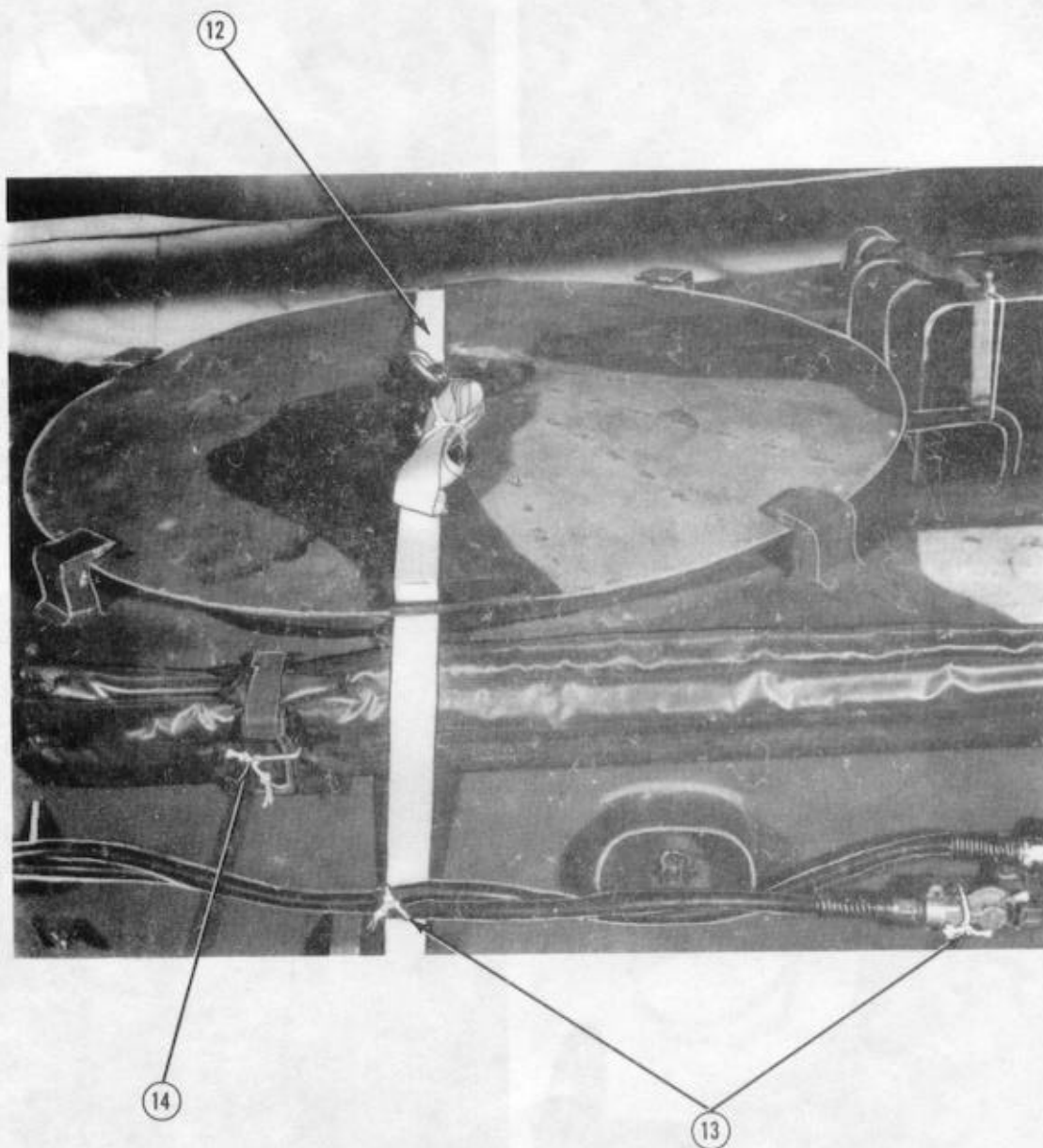
- ④ Set the rear gun tube support block on the trails under the rear of the tube. If necessary, use plywood shims of the proper thickness between the block and the trails for a snug fit.
- ⑤ Set the forward gun tube support blocks on the left trail against the gun tube travel lock. The block with the slightly deeper cut fits on the breech side of the tube travel lock. If necessary, place plywood or lumber shims between the trail and the block for a snug fit. (The gun shown needed an additional piece of 2- by 6-inch lumber on the base of each block.)
- ⑥ Lash the support blocks to the gun tube travel lock with a 15-foot tiedown assembly.
- ⑦ Close the gun tube travel lock, and secure it with the pin provided.
- ⑧ Cover the muzzle and muzzle brake with plastic wrap, or insert the plug provided with the gun into the muzzle (not shown).

Figure 4-11. Continued.



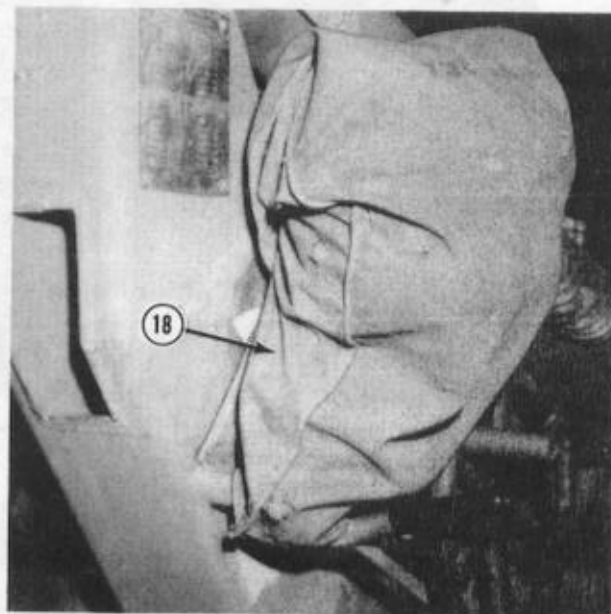
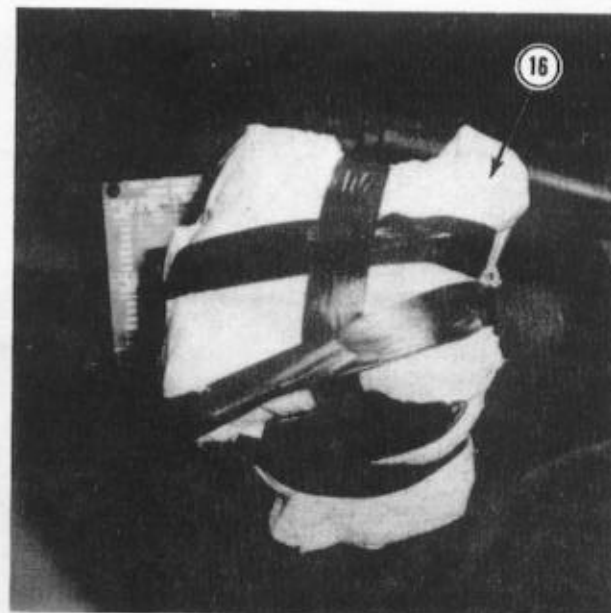
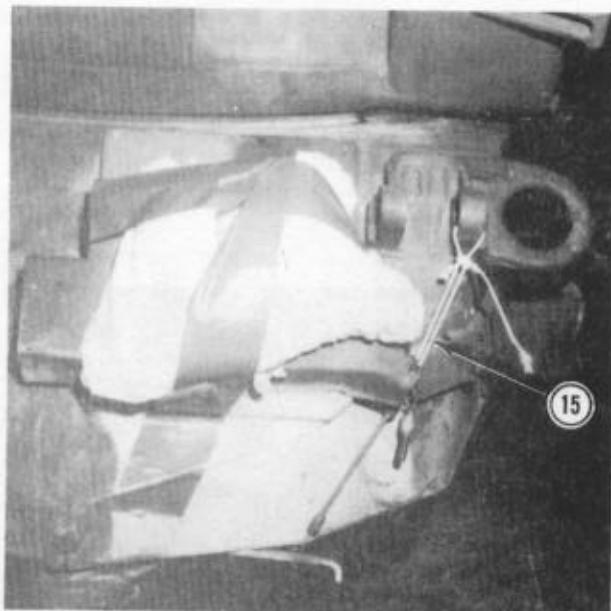
- ⑨ Secure the breechblock with a 15-foot tiedown assembly. Run the strap under the cradle assembly, over the breechblock, and under the thermal warning device.
- ⑩ Put the breechblock cover on the breechblock (not shown).
- ⑪ Lash the gun tube to the left trail with two 15-foot tiedown assemblies. Run one strap around each support block.

Figure 4-12. Gun tube lashed.



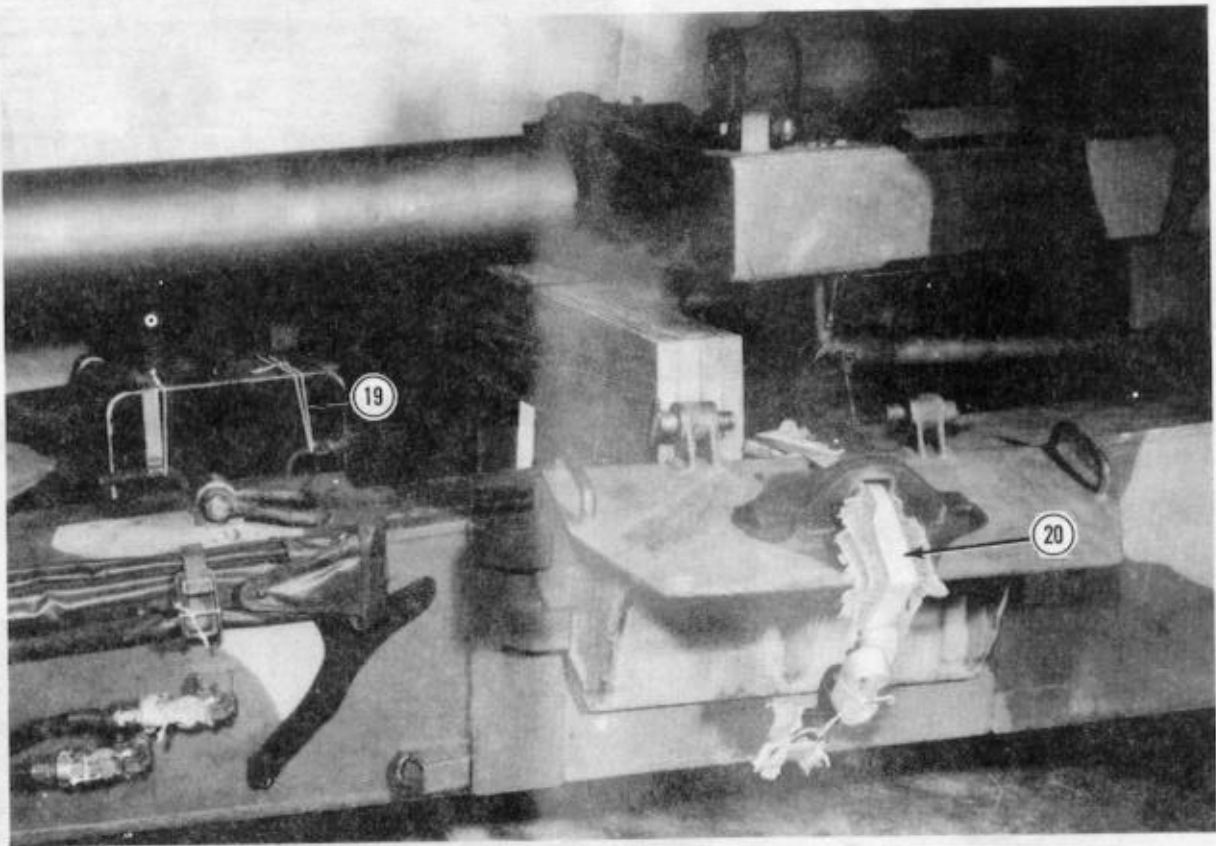
- ⑫ Lash the firing baseplate in its stowed position with a 15-foot tiedown assembly.
- ⑬ Tie the hose assemblies to the cleaning staff, to the lashing on the baseplate, and to the dummy couplings with type III nylon cord.
- ⑭ Tie the hold-down latches on the aiming stakes bracket in the closed position with type III nylon cord. Tie the pump handles in place with type III nylon cord (not shown).

Figure 4-13. Baseplate, hoses, and aiming stakes secured.



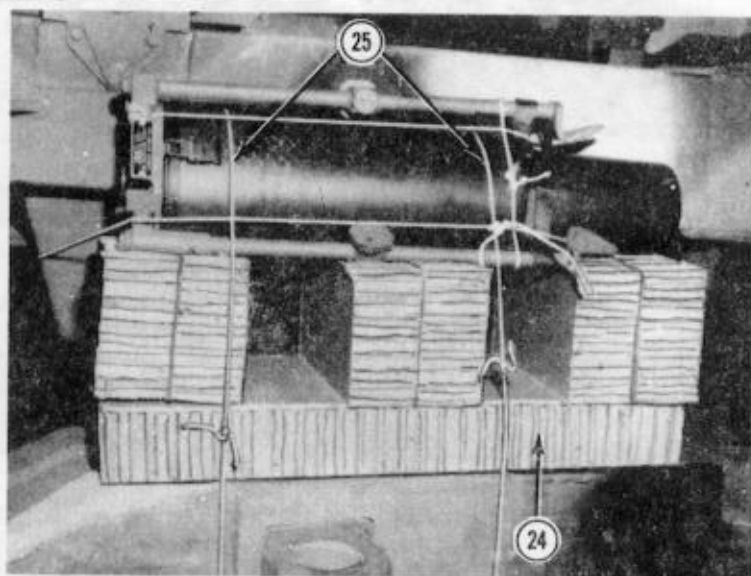
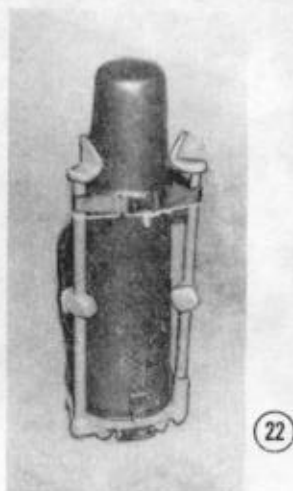
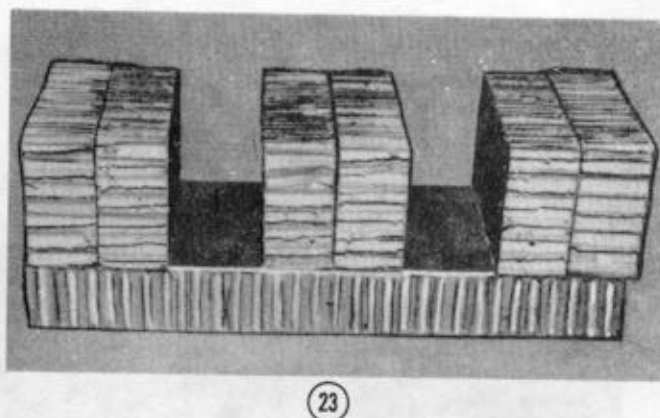
- ⑮ Tie the lock-release lever to one side with type III nylon cord.
- ⑯ Pad the manifold assembly with cellulose wadding, and tape the wadding in place.
- ⑰ Pad the telescope and quadrant mounts (on either side of the howitzer) with cellulose wadding, and tape the wadding in place.
- ⑱ Cover the padded mounts if covers are available.

Figure 4-14. Manifold and quadrant mounts prepared.



- ①⑨ Strap the fire control equipment carrying case in its bracket on the left trail. In addition, tie the case in place with two lengths of type III nylon cord.
- ②⑩ Lash each spade in its bracket (one on each trail) with a 15-foot tiedown assembly. Pad any sharp edges that may contact the strap.

Figure 4-15. Carrying case and spades stowed.

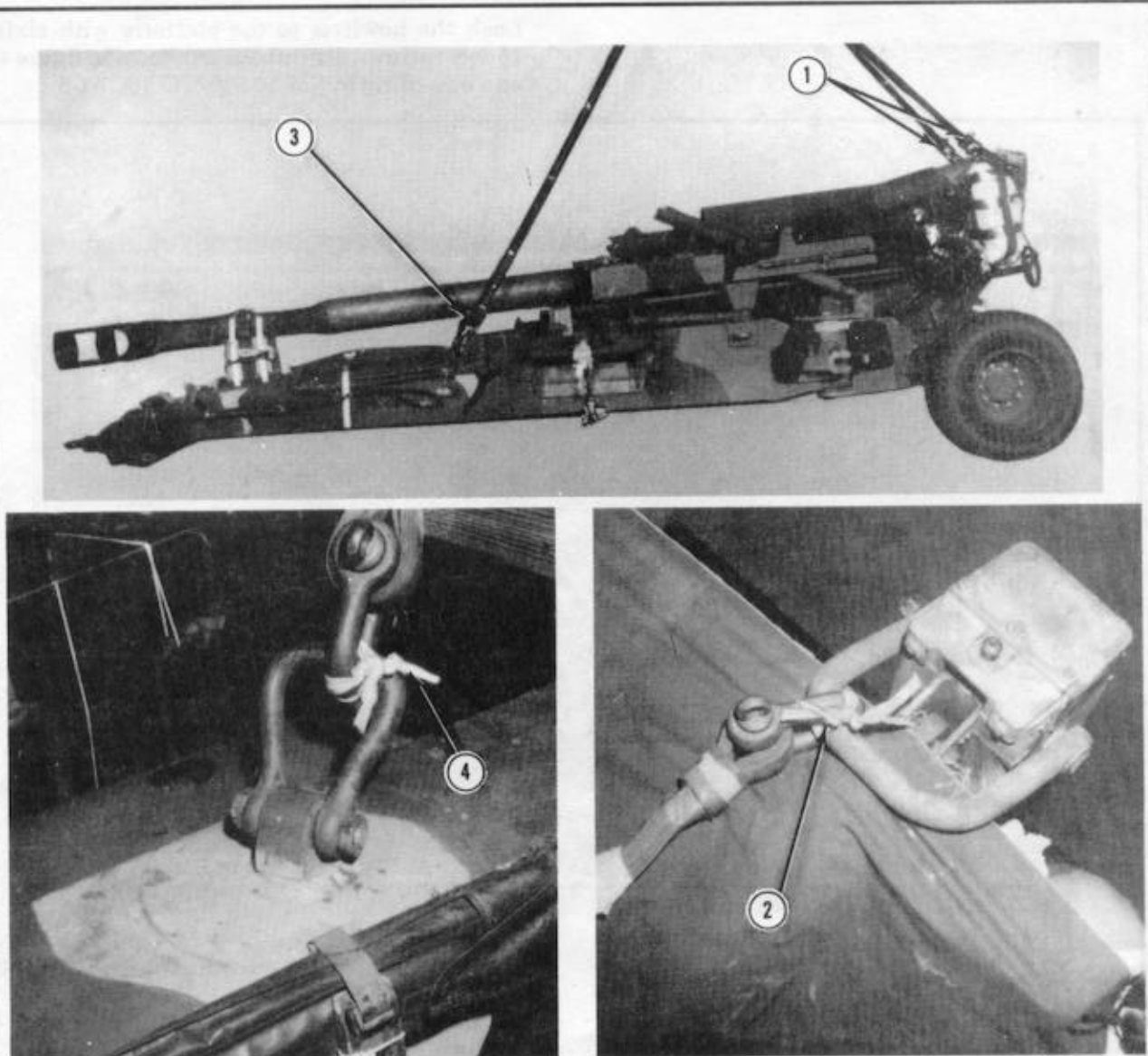


- (21) Take the M1A1 collimator out of its case. Place the legs as shown, and tighten the locking knobs. Wrap the collimator with cellulose wadding, and tape the wadding in place.
- (22) Put the collimator back in its case. Fold the legs up, and tie them in place with type III nylon cord.
- (23) Glue six 6- by 10-inch pieces of honeycomb to a 10- by 26-inch piece of honeycomb as shown.
- (24) Set the honeycomb stack on the left trail.
- (25) Lay the collimator on the honeycomb stack. Tie the honeycomb and the collimator to the trail with lengths of type III nylon cord.

Figure 4-16. Collimator stowed.

4-6. Installing Suspension Slings

Install two 9-foot and two 12-foot (4-loop), type XXVI nylon webbing slings with four screw-pin clevises as shown in figure 4-17.



- ① Bolt a 9-foot sling to each top carriage hoisting link with a screw-pin clevis.
- ② Tie the screw-pin clevis to the hoisting link with a length of doubled 1/2-inch tubular nylon webbing.
- ③ Bolt a 12-foot sling to the lifting clevis on each trail with a screw-pin clevis.
- ④ Tie the screw-pin clevis to the lifting clevis with a length of doubled 1/2-inch tubular nylon webbing.

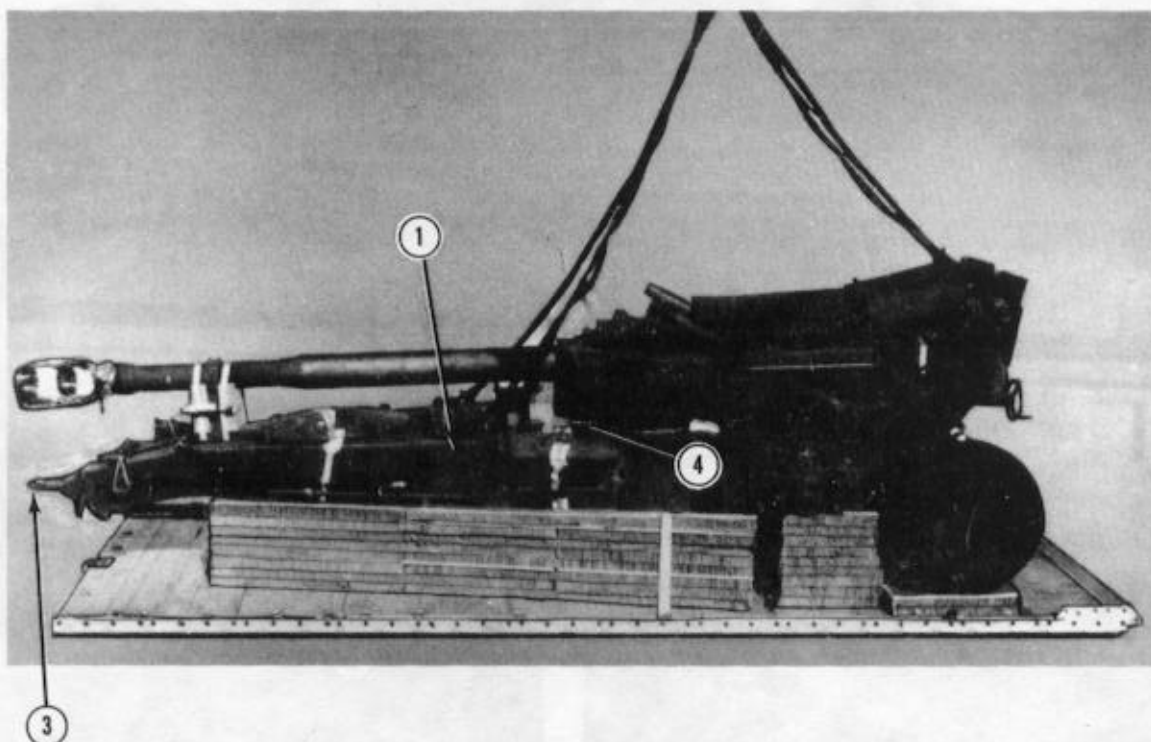
Figure 4-17. Suspension slings installed.

4-7. Setting Howitzer on Platform

Set the howitzer on the honeycomb stacks as shown in figure 4-18.

4-8. Lashing Howitzer

Lash the howitzer to the platform with sixteen 15-foot tiedown assemblies as shown in figure 4-19 and according to FM 10-500/TO 13C7-1-5.



- ① Center the right trail on stack No 4.
- ② Center the left trail on stack No 5 (not shown).
- ③ Let the lunette overhang the rear edge of the platform by 15 inches.
- ④ Insure the rear tube support blocks (fig 4-11) are resting solidly on stack No 3.

Figure 4-18. Howitzer sitting on platform.

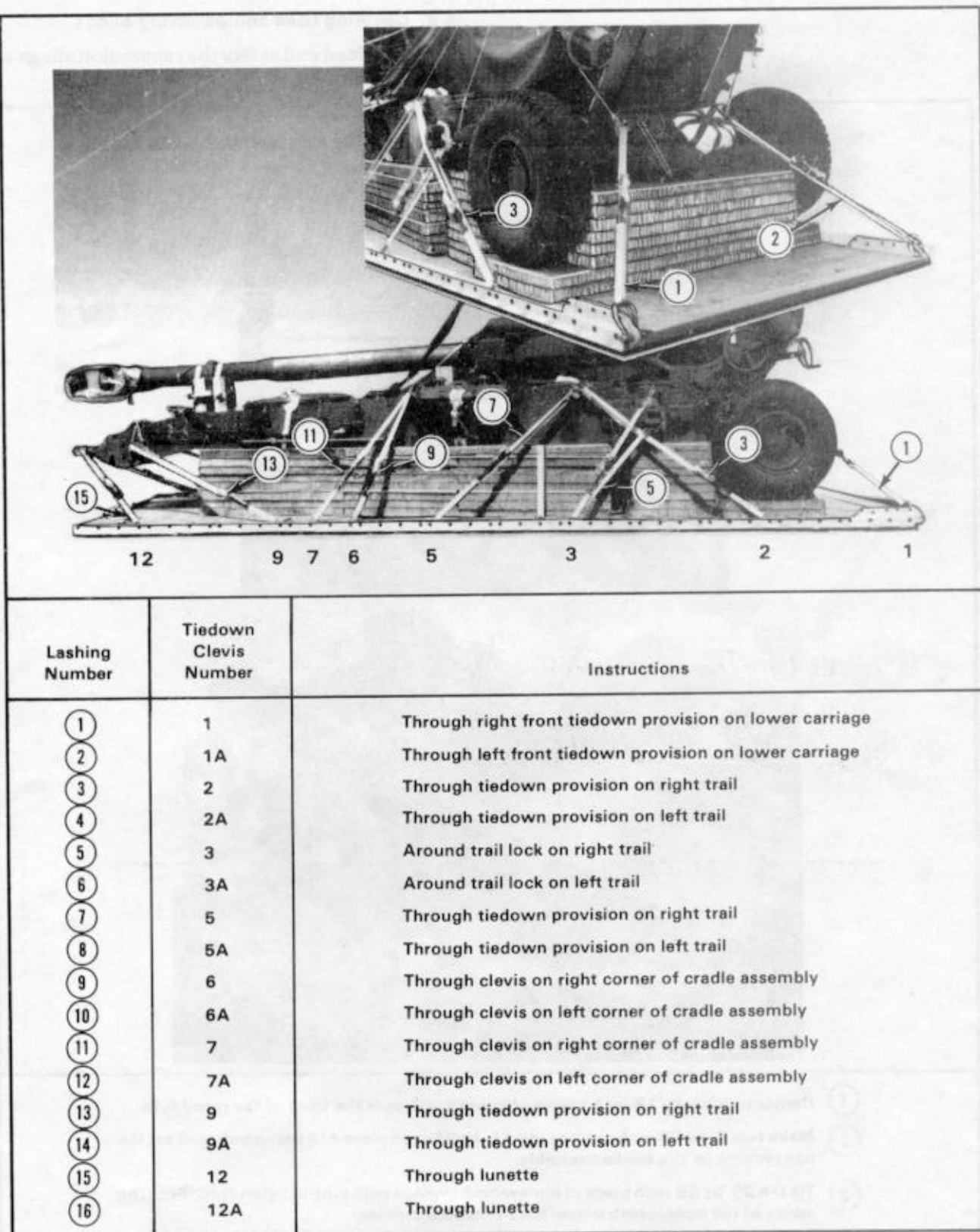
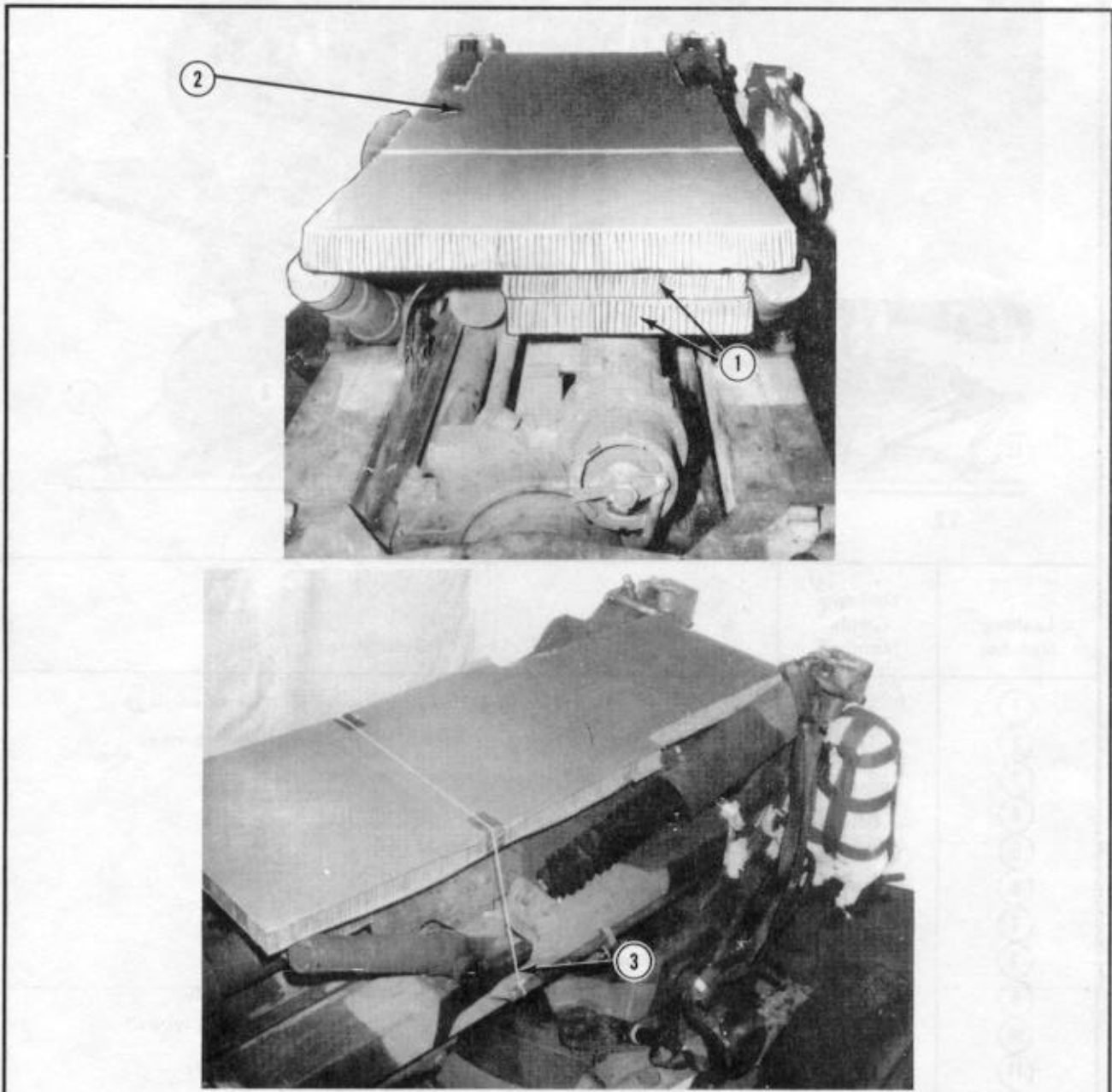


Figure 4-19. Lashings 1 through 16 installed.

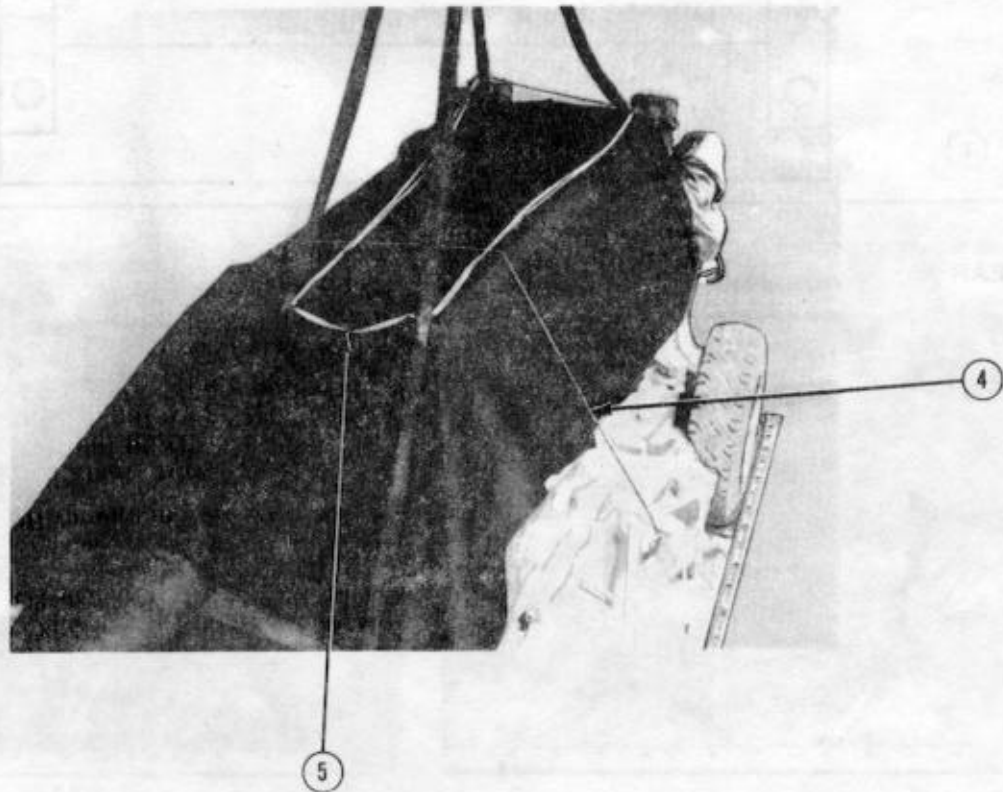
4-9. Covering Load and Safetizing Slings

Cover the load and safety the suspension slings as shown in figure 4-20.



- ① Center two 12- by 18-inch pieces of honeycomb over the front of the recoil tube.
- ② Make two 3- by 36-inch cutouts in a 36- by 96-inch piece of honeycomb, and set the honeycomb on the cradle assembly.
- ③ Tie the 36- by 96-inch piece of honeycomb in place with type III nylon cord. Tape the edges of the honeycomb where the nylon cord crosses.

Figure 4-20. Load covered and suspension slings safetied.



- ④ Tie a 12- by 12-foot piece of cotton duck cloth over the load with lengths of type III nylon cord.
- ⑤ Safety the suspension slings with a deadman's tie according to FM 10-500/TO 13C7-1-5.

Figure 4-20. Continued.

4-10. Stowing Cargo Parachutes

Install the parachute stowage platform as shown in figure 4-21. Prepare and stow six G-11A cargo parachutes as outlined in FM 10-500/TO 13C7-1-5 and as shown in figure 4-22.

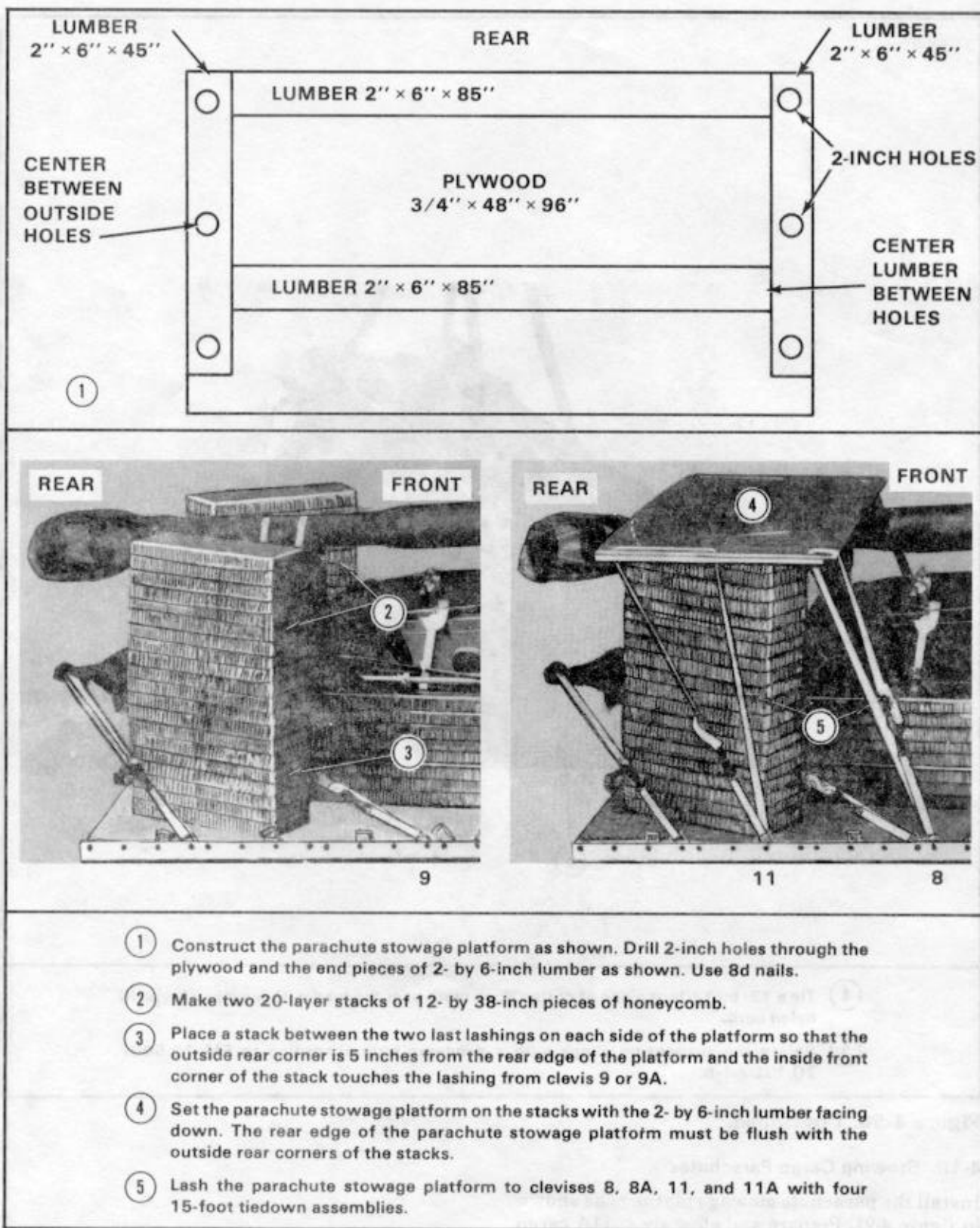
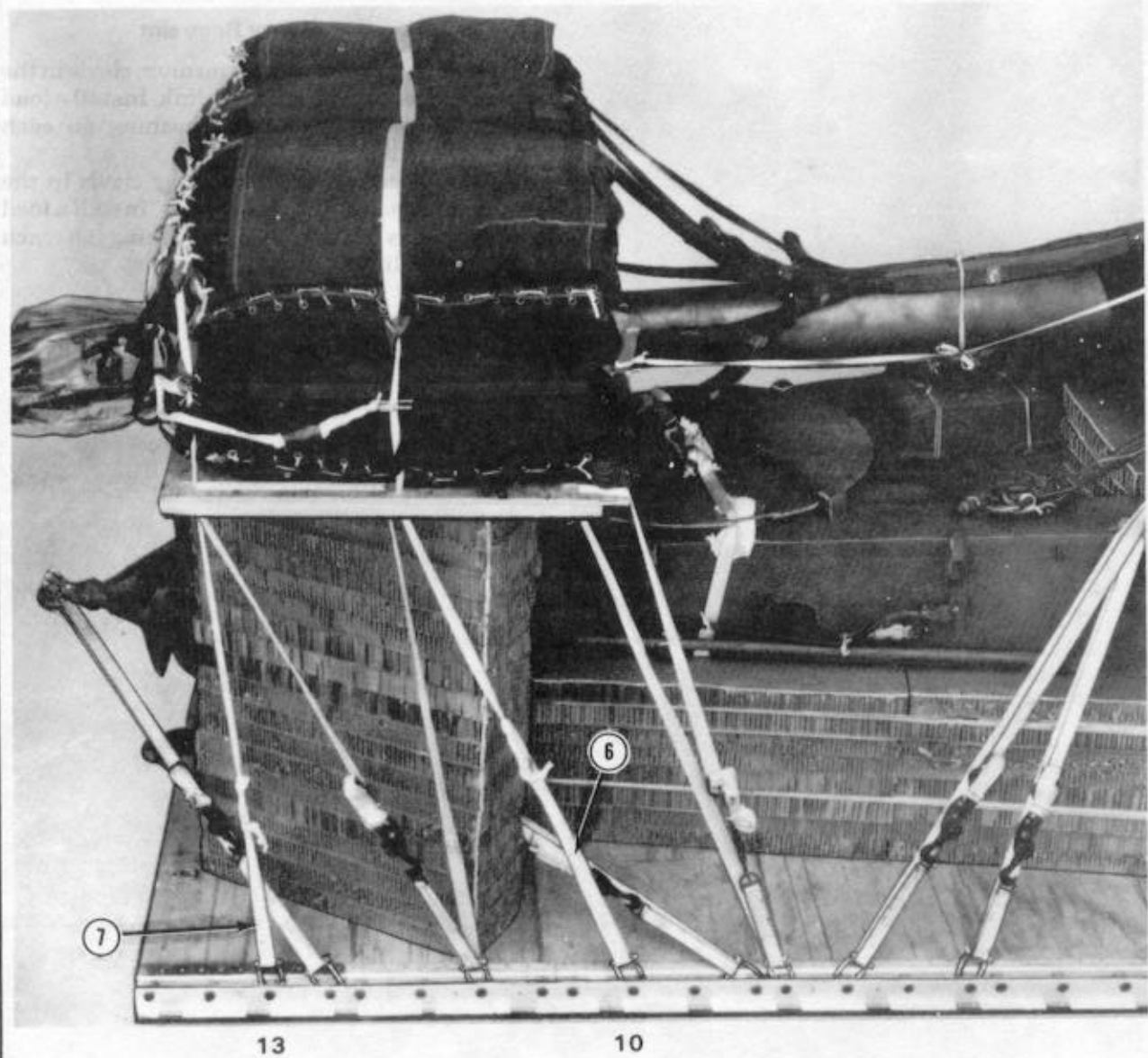


Figure 4-21. Parachute stowage platform installed.



- (6) Tie the ends of the first restraint strap to load tiedown clevises 10 and 10A.
- (7) Tie the ends of the second restraint strap to load tiedown clevises 13 and 13A.

Figure 4-22. Cargo parachutes stowed.

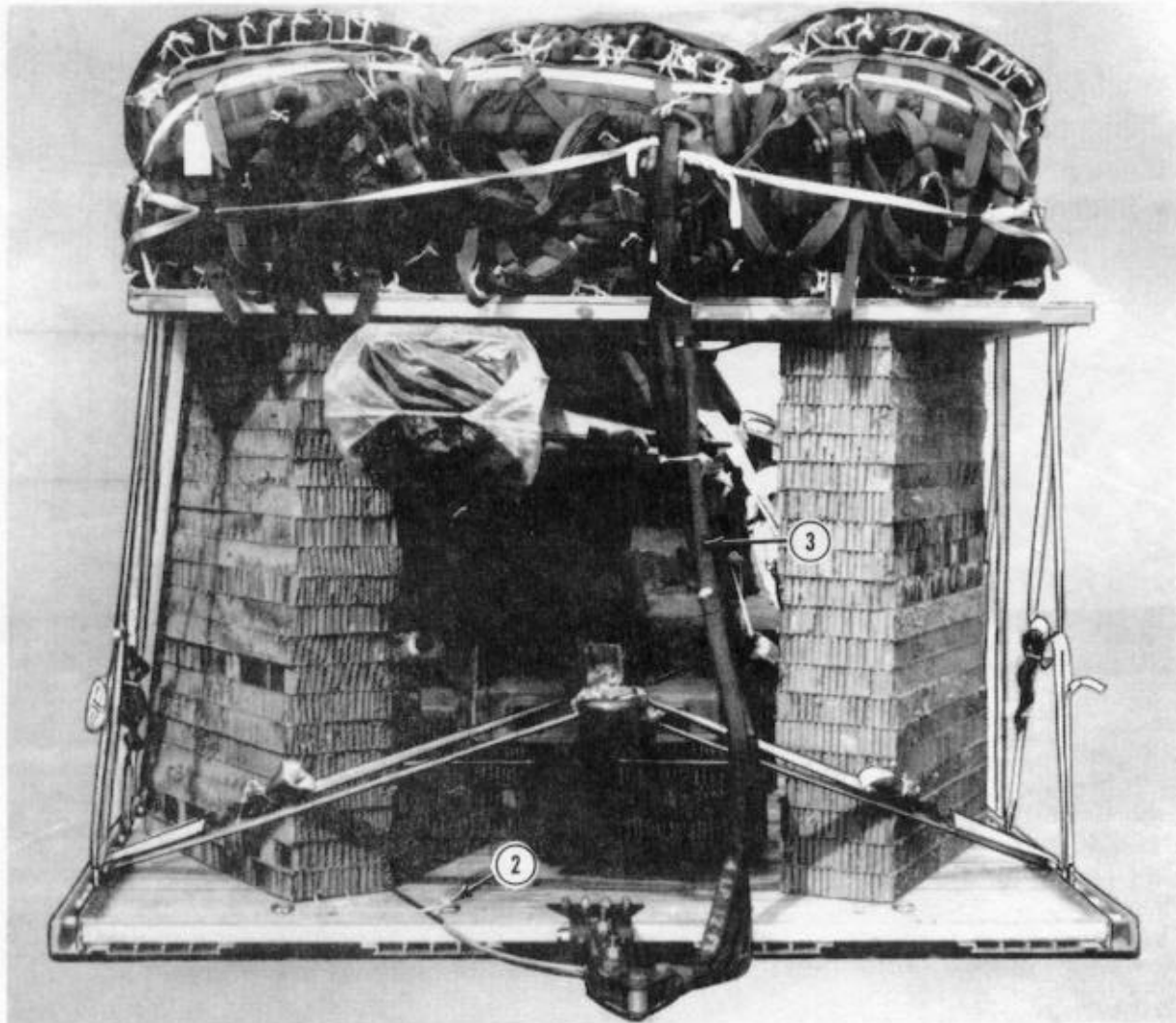
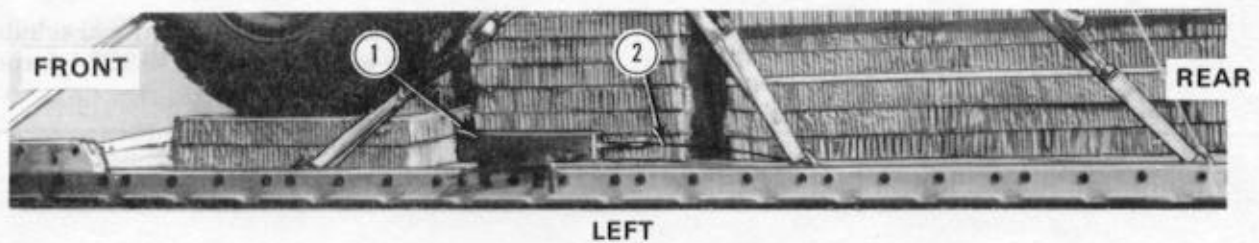
4-11. Installing Extraction System

Use the EFTC extraction system on the type V platform. Install the EFTC extraction system according to FM 10-500/TO 13C7-1-5 and as shown in figure 4-23.

4-12. Installing Emergency Restraint

a. C-130 Aircraft. Install a medium clevis in the front hole of each multipurpose link. Install a load tiedown clevis to the second bushing on each multipurpose link.

b. C-141 Aircraft. Install a large clevis in the front hole of each multipurpose link. Install a load tiedown clevis to the second bushing on each multipurpose link.

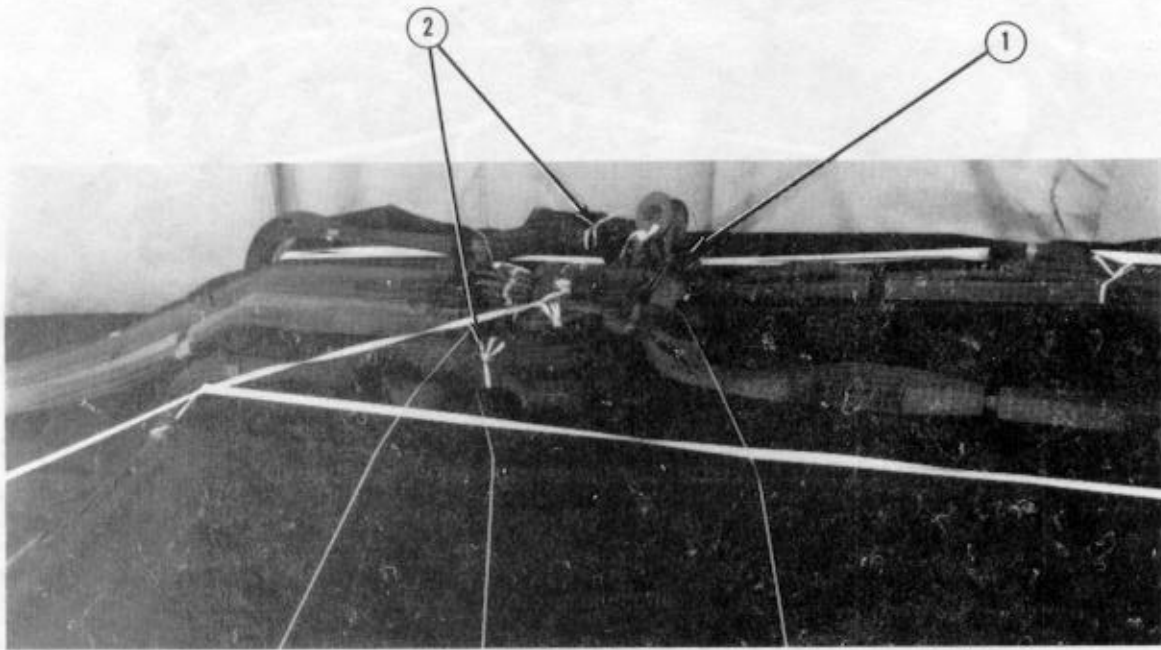


- ① Bolt the actuator bracket to the rear pair of actuator holes in the left side rail.
- ② Use a 20-foot cable. Run it rearward inside of the lashings and under the bushings, and tie the cable to deck ring C with 80-pound cotton webbing.
- ③ Use a 12-foot (4-loop), type XXVI sling as the deployment line. Fold and tie the slack with 80-pound cotton webbing.

Figure 4-23. EFTC installed.

4-13. Installing Release System

Prepare and install an M-2 cargo parachute release according to FM 10-500/TO 13C7-1-5 and as shown in figure 4-24.



- ① Install the M-2 cargo parachute release according to FM 10-500/TO 13C7-1-5.
- ② Fold and tie the excess suspension slings.
- ③ Tie the riser extension to the gun tube with 80-pound cotton webbing (not shown). DO NOT use tape on the gun tube. Note: If needed, one stow of riser extension may be removed from the riser extension compartment of each cargo parachute.

Figure 4-24. Cargo parachute release installed.

4-14. Placing Extraction Parachute

Place the extraction parachute as described below.

a. *C-130 Aircraft.* Place a 28-foot cargo extraction parachute and a 60-foot (3-loop), type XXVI nylon webbing extraction line on the load for installation in the aircraft.

b. *C-141 Aircraft.* Place a heavy-duty 28-foot cargo extraction parachute and a continuous 140-foot (3-loop), type XXVI nylon webbing extraction line on the load for installation in the aircraft. The extraction line is connected to the adapter web of

the parachute with a 5 1/2-inch, two-point link assembly.

CAUTION

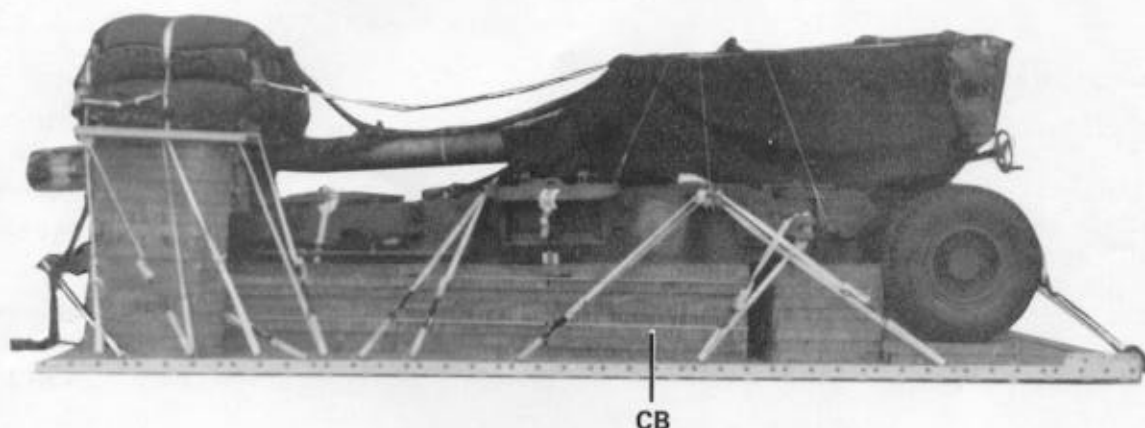
The light-duty 28-foot cargo extraction parachute must NOT be used when the load will be dropped from a C-141 aircraft.

4-15. Marking Rigged Load

Mark the rigged load according to FM 10-500-2/TO 13C7-1-5 and as shown in figure 4-25. Complete DD Form 1387-2 (Special Handling Data/ Certification), and securely attach it to the load. If the load varies from that shown, the weight, height, CB, and parachute requirements must be recomputed.

CAUTION

Make the final rigger inspection required by FM 10-500-2/TO 13C7-1-5 before the load leaves the rigging site.

**RIGGED LOAD DATA**

* Weight:	Load shown.....	21,030 pounds
	Maximum load allowed.....	22,500 pounds
Height.....		96 inches
Width.....		108 inches
Length.....		311 inches
Overhang:	Front (tandem link).....	5 inches
	Rear (extraction system).....	18 inches
Center of Balance (from front edge of platform)		126 inches
Extraction system		EFTC

* Includes 610 pounds of accompanying equipment

Figure 4-25. M198, 155-mm howitzer rigged for low-velocity airdrop on type V platform.

4-16. Equipment Required

The equipment needed to prepare and rig the M198, 155-mm howitzer for a low-velocity airdrop on the type V platform is listed in table 4-1.

Table 4-1. Equipment required for rigging M198, 155-mm howitzer for low-velocity airdrop on the type V platform

National Stock Number	Item	Quantity
8040-00-273-8713	Adhesive, paste, 1-gal	As required
1670-00-090-5354	Clevis Assembly, suspension, large, 1-in	5
4030-00-432-2516	Clevis, suspension, with screw pin and sleeve	4
8305-00-242-3593	Cloth, cotton duck, 60-in	As required
4020-00-240-2146	Cord, nylon, type III, 550-lb	As required
1670-00-434-5787	Coupling, airdrop, extraction force transfer, with 20-ft cable	1
1670-00-360-0329	Cover, link (Add one for C-141 aircraft.)	19
8135-00-664-6958	Cushioning Material, packaging, cellulose wadding	As required
	Line, extraction, type XXVI nylon webbing:	
1670-01-062-6313	60-ft (3-loop) (for C-130)	1
1670-01-107-7651	140-ft (3-loop) (for C-141)	1
1670-00-783-5988	Link Assembly, type IV	18
	Link Assembly, two-point	1
5306-00-435-8994	Bolt, 1-in diam, 4-in long	(2)
5310-00-232-5165	Nut, 1-in	(2)
1670-00-003-1953	Plate, side, 3 3/4-in	(2)
5365-00-007-3414	Spacer, large	(2)
	Lumber:	
5510-00-220-6448	2- by 6- by 12-in	2
5510-00-220-6248	2- by 10- by 12-in	6
5510-00-220-6248	2- by 10- by 57-in	4
5315-00-164-5121	Nail, steel wire, common, 20d	As required
1670-00-753-3928	Pad, energy-dissipating, honeycomb,	
	3- by 36- by 96-in:	34 sheets
	6- by 10-in	(6)
	9- by 36-in	(2)
	10- by 26-in	(1)
	12- by 18-in	(2)
	12- by 38-in	(40)
	18- by 30-in	(15)
	18- by 54-in	(16)
	18- by 96-in	(16)
	30- by 80-in	(9)
	36- by 75-in	(6)
	36- by 96-in	(3)
1670-01-183-2678	Panel, sling/extraction line	2
	Parachute:	
1670-00-269-1107	Cargo, G-11A	6
1670-00-040-8135	Cargo, extraction, 28-ft, heavy-duty (for all aircraft)	1
	Platform, airdrop, type V, 24-ft:	1
1670-01-162-2375	Bracket, inside EFTA	(1)
1670-01-162-2374	Bracket, outside EFTA:	(1)
5306-00-206-2865	Bolt, machine, 3/8-in diam, 1 9/16-in long	(2)
5310-00-950-0039	Nut	(2)
5310-00-167-0821	Washer, flat, 3/8-in diam	(4)

Table 4-1. Continued

National Stock Number	Item	Quantity
1670-01-162-2372	Clevis, load tiedown:	(26)
5306-00-156-2644	Bolt	(26)
5310-00-088-0552	Nut, self-locking	(26)
1670-01-162-2373	Spacer, clevis	(26)
5310-00-809-4061	Washer, flat	(26)
1670-01-162-2376	Extraction bracket assembly	(1)
1670-01-162-2381	Multipurpose link	(2)
1670-01-162-2388	Pad, roller, 24-ft:	(4)
5306-00-206-2865	Bolt, machine, 3/8-in diam, 1 9/16-in long	(192)
5310-00-167-0821	Washer, flat, 3/8-in diam	(200)
1670-01-168-8397	Panel Assembly, main	(11)
1670-01-168-8398	Panel Assembly, rear	(1)
1670-01-162-2366	Rail, platform side, 24-ft:	(2)
5306-00-638-7718	Bolt, machine, 1/2-in diam, 3 13/64-in long	(96)
1670-01-162-2384	Bushing, side rail	(96)
5310-00-167-0823	Washer, flat, side rail, 7/16-in diam	(96)
5530-00-128-4981	Plywood, 3/4-in:	
	18- by 30-in	1
	18- by 48-in	2
	18- by 54-in	2
	18- by 88-in	2
	18- by 96-in	2
1670-01-097-8817	Release, cargo parachute, M-2	1
	Sling, cargo, airdrop:	
	For deployment line:	
1670-01-062-6307	12-ft (4-loop), type XXVI nylon webbing	1
	or	
1670-00-823-5041	12-ft (3-loop), type X nylon webbing	1
	For suspension:	
1670-00-432-2501	9-ft (4-loop), type XXVI nylon webbing	2
1670-00-432-2506	12-ft (4-loop), type XXVI nylon webbing	2
	For riser extension:	
1670-00-753-3794	20-ft (2-loop), type X nylon webbing	24
	or	
1670-01-062-6302	20-ft (2-loop), type XXVI nylon webbing	24
	Stowage Platform:	
5510-00-220-6448	Lumber, 2- by 6- by 45-in	2
5510-00-220-6448	Lumber, 2- by 6- by 85-in	2
5315-00-010-4659	Nail, steel wire, common, 8d	As required
5530-00-128-4981	Plywood, 3/4- by 48- by 96-in	1
1670-00-040-8219	Strap, parachute release, multicut	2
7510-00-266-5016	Tape, adhesive, 2-in	As required
1670-00-937-0271	Tiedown Assembly, 15-ft:	28
1670-00-937-0272	Binder, load, 10,000-lb	(27)
5365-00-937-0147	D-ring, heavy-duty	(29)
1670-00-937-0273	Strap, 15-ft	(29)
	Webbing:	
8305-00-268-2411	Cotton, 80-lb	As required
8305-00-082-5752	Nylon, tubular, 1/2-in, 1,000-lb, natural	As required
8305-00-263-3591	Nylon, type VIII, 3,600-lb	As required